10/29/2020

Alaska Department of Environmental Conservation (ADEC)

RE: Alaska Regulation 18 AAC 50.077(c)
Report Revision Hearth & Home Technologies Dauntless FlexBurn Non-Catalytic

To Whom it May Concern:

This cover letter provides an overview of results generated from ADEC's review of OMNI certification report 0061WS104E generated for Hearth & Home Technologies. Stove model Dauntless FlexBurn Non-Catalytic was tested in October 2019 to test standard ASTM 3053, and ASTM 2515. In 2020, ADEC reviewed a Non-CBI version of the report and released a list of findings from their report review. The following is a list of responses to the ADEC audit in the order they appeared in the Summary of Review.

1. **Test Report Elements**
   - *a.)* ADEC requires first hour emissions be less than 6 grams per hour, highest first hour emissions result for this series is 6.63 grams per hour. By ADEC regulations this disapproves the appliance. This regulation does not exist in certification to ASTM standards.
   - *b.) Weighted average CO not reported* - Straight average, and a weighted average CO emissions value have been added to Table 3 of the report.
   - *c.) Manufacturer's Instructions not reported* - Manufacturer's operating instructions are provided on page 116 of the certification report. Operating instructions shown in the user manual are designed after fueling protocols used during testing.
   - *d.) Firebox dimensions and calculations* - Prior to 2019 OMNI considered firebox dimensions as confidential business information and were not included in the non-CBI report. A firebox volume calculation has been added to the revised non-CBI report.

OMNI-Test Laboratories, Inc.

Product Testing & Certification
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Test Run Data

a.) *Train precision % not reported* - Actual train precision % was not reported, quality checks do show Dual Train Comparison results are Acceptable on Wood Heater results page for each test run. Precision percentage and gram per kilogram comparison have been added to revised report for each test on the results page. Passing criteria is precision within 7.5% **or** gram per kilogram within 0.5.

b.) *Lowest burn rate tested cannot be determined* - Pages 10, and 159 of the certification report show that testing was conducted with the air control fully closed.

Appliance Fueling

a.) Fuel Moisture content load (wb%) not reported -. Fuel load moisture calculated to a wet basis can be viewed on pages 134, 158, 168, and 191.

b.) *Fuel piece configuration not reported* - Fuel load configuration provided in photo documentation on pages 13 – 16.

Reporting

a.) *Summary table complete* - Fuel loading density is provided in table 6 of the certification report, fuel moisture information provided above.

b.) *Test report complete* - Requested information is explained above.

c.) *30-day notice submitted* - This information is not included in any certification reports.

d.) *Testing on proposed dates* - This information is not included in any certification report.

e.) *60-day report to EPA* - This information is not included in any certification report.

Findings of this evaluation by ADEC did not produce any deficiencies that caused the Certified emissions and efficiency values for the Hearth & Home Technologies model Dauntless FlexBurn Non-Catalytic to change. All requested changes are to simply clarify information already included in the certification report.

If you have any questions, please do not hesitate to contact ***OMNI***.

Sincerely,

Bruce Davis
Testing Manager

Non-Confidential Business Information (Non-CBI)

Certification Test Report

Hearth and Home Technologies, Inc.

Freestanding Wood Stove

Model: Dauntless FlexBurn

Prepared for:	Hearth and Home Technologies, Inc. 352 Mountain House Road Halifax, PA 17032
Prepared by:	OMNI-Test Laboratories, Inc. 13327 NE Airport Way Portland, OR 97230 (503) 643-3788
Test Period:	October 4, 2019 – October 5, 2019
Original Report Date:	December 5, 2019
Report Number:	0061WS104E

- *Document Edition Number (001)10/29/2020* -

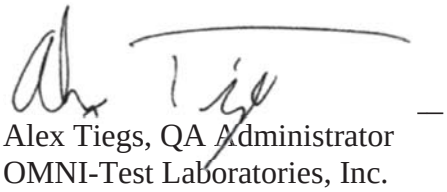
AUTHORIZED SIGNATORIES

This report has been reviewed and approved by the following authorized signatories:

Technician:

Bruce Davis
OMNI-Test Laboratories, Inc.

QA Review:



Alex Tiegs, QA Administrator
OMNI-Test Laboratories, Inc.

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Section 1

Sampling Procedures and Test Results

INTRODUCTION

Hearth and Home Technologies, Inc. retained *OMNI* to perform U.S. Environmental Protection Agency (EPA) certification testing on the Dauntless FlexBurn wood stove. The Dauntless FlexBurn wood stove is a radiant freestanding-type room heater. The firebox is constructed of cast iron. Usable firebox volume was measured to be 1.82 cubic feet and the stove is vented through a six-inch flue collar located at the rear of the stove top.

The testing was performed at a Hearth & Home facility located in Bethel Vermont. The altitude of the laboratory is 590 feet above sea level. The unit was received in good condition and logged in on October 1, 2019, then assigned and labeled with *OMNI* ID #2389. *OMNI* representative Bruce Davis conducted the certification testing and completed all testing by October 5, 2019.

This report is organized in accordance with the EPA-recommended outline and is summarized in the Table of Contents immediately preceding this section. The results in this report are limited to the item submitted.

SAMPLING PROCEDURE

The Dauntless FlexBurn wood stove was tested in accordance with the U.S. EPA 40 CFR Part 60, Subpart AAA – Standards of Performance for New Residential Wood Heaters using EPA Method 28R, ASTM E2515 and ASTM E3053. Particulate emissions were measured using sampling trains consisting of two filters (front and back).

The model Dauntless FlexBurn was tested for thermal efficiency and carbon monoxide (CO) emissions in accordance with CSA B415.1-10 using Maple and Beech cord wood.

SUMMARY OF RESULTS

The weighted average emissions of the three test runs included in the results indicate a particulate emission rate of 1.10 grams per hour. A total of four certification tests were conducted; Run number three was a high burn conducted to create a coal bed for run 4, no emissions sampling occurred during this test.

The Dauntless FlexBurn results are within the emission limit of 2.5 g/hr. for affected facilities when tested with cord wood, manufactured on or after May 15, 2020.

The proportionality results for all 4 test runs were acceptable. Quality check results for each test run are presented in Section 4 of this report.

INDIVIDUAL RUN SUMMARIES – Certification Testing

Run 1 - Test procedures followed to produce a high burn rate with a primary air setting of fully open. Observed burn rate was calculated at 3.68 kg/hr. Emissions results were calculated using particulate sampling from Beech cordwood kindling, start-up fuel, and test fuel load combined (cold to hot). Burn rate, and efficiency were calculated using data from the test fuel load only (hot to hot).
No sampling anomalies occurred, this test run was determined to be valid for inclusion in the weighted average.

Run 2 - Test procedures were followed to produce a medium burn rate with a primary air setting of full closed. Observed burn rate was calculated at 0.95 kg/hr. Emissions and efficiency results were calculated using a hot to hot burn cycle using Beech cordwood, a coal bed generated by the high burn procedure was used. No sampling anomalies occurred, this test run was determined to be valid for inclusion in the weighted average.

Run 3 - Test procedures followed to produce a high burn rate with a primary air setting of fully open. Observed burn rate was calculated at 3.44 kg/hr. using data from the fuel load only (hot to hot). Emissions sampling on the Maple cordwood fuel load did not occur during this procedure, it was conducted to create a coal bed for run 4.

Run 4 - Test procedures were followed to produce a low burn rate with a primary air setting of two clicks from full closed. Observed burn rate was calculated at 0.82 kg/hr. Emissions and efficiency results were calculated using a hot to hot burn cycle using Maple cordwood, a coal bed generated by the high burn procedure was used. No sampling anomalies occurred, this test run was determined to be valid for inclusion in the weighted average.

Table 1 – Particulate Emissions

Run	**Burn Rate** Calculated from a Hot to Hot burn cycle (kg/hr dry)	**ASTM E2515 Emissions** (g/hr)	**ASTM E3053 Weighting Factor** (%)	**ASTM E3053 Weighted Emissions** (g/hr)
1	3.68	[1.]3.50	20	0.700
2	0.95	0.34	40	0.136
4	0.82	0.65	40	0.260
The sum of weighted particulate emission of 3 test runs: 0.700 + 0.136 + 0.26 = **1.10**				

1. Results are from a cold to hot cycle including kindling and start-up fuel.

Table 2 – Particulate Emissions (First Hour)

Run	**ASTM E2515 Emissions – First Hour** (g/hr)
1	6.63
2	0.27
4	5.17

Table 3 – B415.1 Efficiency and CO Emissions

Run	**Heat Output (BTU/hr)**	**HHV Efficiency (%)**	**LHV Efficiency (%)**	**CO Emissions (g/MJ Output)**	**CO Emissions (g/kg Dry Fuel)**	**CO Emissions (g/min)**
1	49,428	73.1	78.3	5.96	81.90	5.17
2	12,933	76.5	82.0	5.30	76.20	1.204
4	12,252	79.1	84.6	3.72	58.69	0.800
Weighted average HHV efficiency of 3 tests: 14.62 + 30.60 + 31.64 = **76.9 %.**						
Weighted Average CO Emissions: (1.03 + 0.48 + 0.32) /3 = **0.61 g/min**						
Average CO emissions: (5.17 + 1.204 + 0.800) /3 = **2.39 g/min**.						

Table 4 – Test Facility Conditions

Run	Room Temperature (°F)		Barometric Pressure (Hg)		Air Velocity (ft/min)	
	Before	**After**	**Before**	**After**	**Before**	**After**
1	72	81	29.52	29.60	<50	<50
2	81	74	29.63	29.76	<50	<50
3	71	82	29.90	29.87	<50	<50
4	81	74	29.87	29.78	<50	<50

Table 5 – Kindling and Start-up Fuel Description Summary

Run	**Kindling Weight Wet Basis** (lbs)	**Start-up Fuel Weight Wet Basis** (lbs)	**Residual Start-up fuel weight (lbs)**
1	3.71	5.61	2.7
3	3.46	5.37	2.7

Table 6 – Fuel Measurement and Cordwood Description Summary – TEST

Run	Test Fuel Wet Basis (lbs)	Firebox Volume (ft^3)	Fuel Loading Density Wet Basis (lbs/ft^3)	Test Fuel Dry Basis (lbs)	[1.] Test Fuel Consumed During Test Dry Basis (lbs)	Piece Length (in)
1	18.87	1.82	10.4	[1]15.56 + 8.0	19.0	5@16
2	20.82	1.82	11.4	17.04	16.7	5@16
3	17.98	1.82	9.9	[1]14.74+7.6	17.8	5@16
4	21.63	1.82	11.9	17.64	16.6	5@16

1. Includes start-up and kindling fuel for high burn tests 1, and 3.

Table 7 – Dilution Tunnel Gas Measurements and Sampling Data Summary

Run	Length of Test (min)	Average Dilution Tunnel Gas Measurements		
		Velocity (ft/sec)	Flow Rate (dscf/min)	Temperature (°F)
1	156	19.53	205.4	112
2	480	19.19	211.0	90
4	586	18.88	209.2	88

Table 10 – Test Configurations

Run	Startup Procedures	Combustion Air
1	Fuel Loading: Kindling and start-up fuel loaded separately, a torch was used for 40 seconds to establish a fire. At 15.5 minutes added start-up fuel. placed fuel load into the firebox and closed the loading door. Loading required less than 1 minute to complete. Door: For kindling and start-up fuel, loading door was closed by 2.0 minutes. Test fuel load; fuel loading door was closed at 55 seconds. Primary Air: Air control fully open for the entire test. Bypass: Kindling, bypass closed by 16 minutes, fuel load, bypass closed by 55 seconds. Secondary: No user control for secondary air. Fan: Fan operated on high the entire test.	Fully open for entire test.
2	Fuel Loading: Test fuel loaded onto coal bed generated by test number 1 in 50 seconds. Door: Closed by 55 seconds. Primary Air: At test setting (full closed) the entire test. Bypass: Closed by 55 seconds. Secondary: No user control for secondary air. Fan: Fan on low entire test.	Full closed for entire test.
3	Fuel Loading: Kindling and start-up fuel loaded together, a torch was used for 30 seconds to establish a fire. Fuel loading required 48 seconds to complete. Door: For kindling and start-up fuel, loading door was closed by 120 seconds. Test fuel load; fuel loading door was closed 60 seconds after loading. Primary Air: Air control fully open for the entire test. Bypass: Kindling, bypass closed by 20 minutes, fuel load, bypass closed by 60 seconds. Secondary: No user control for secondary air. Fan: Fan on high entire test.	Fully open for entire test.
4	Fuel Loading: Test fuel loaded onto coal bed generated by test number 3 by 50 seconds. Door: Closed by 60 seconds. Primary Air: At test setting (2 clicks from full closed) entire test. Bypass: Closed by 50 seconds. Secondary: No user control for secondary air. Fan: Fan on medium entire test.	Two “clicks” from full closed

Section 2

Photographs/Appliance Description/Drawings

Hearth and Home Technologies

Dauntless FlexBurn

Test Dates: October 4, 2019 – October 5, 2019

Hearth and Home Technologies
Dauntless FlexBurn

Run 1 – Start-Up and Kindling Fuel

Run 1 – Fuel Load

Run 1 – Ignition of Kindling

Run 1 – Start-Up Fuel Loaded

Run 1 – Fuel Load, Loaded

Run 1 – Remaining Coals

Run 2 – Fuel Load

Run 2 – Fuel Load, Loaded

Run 2 – Remaining Coals

Run 3 – Start-Up and Kindling Fuel

Run 3 – Fuel Load

Run 3 – Ignition of Kindling

Run 3 – Fuel Load, Loaded

Run 4 – Fuel Load

Run 4 – Fuel Load, Loaded

Run 4 – Remaining Coals

WOOD HEATER DESCRIPTION

Appliance Manufacturer: Hearth and Home Technologies

Wood Stove Model: Dauntless FlexBurn

Type: Non-Catalytic **r**adiant freestanding

WOOD HEATER INFORMATION

Materials of Construction: The unit is constructed primarily of cast iron. The firebox is lined with refractory brick that measures 9.75" x 3.5" x 1.25". The feed door has a 11.05" x 7.92" glass panel and 0.313" gasket.

Air Introduction System: Primary air is controlled by a Bi-metallic spring thermostat located at the right rear of the stove top. Moving the control arm fully to the left opens the air control, fully to the right closes the air. As the spring heats up, it tightens causing the controlling damper to close. Secondary air is un-controlled, it enters the appliance through an opening located at the rear of the stove on the bottom side. Air travels into the refractory secondary combustion system and enters the flame path through orifices in the refractory walls.

Combustion Control Mechanisms: Primary air is controlled by a Bi-metallic spring thermostat located at the right rear of the stove top. Moving the control arm fully to the left opens the air control, fully to the right closes the air. As the coil spring heats up, it tightens causing the controlling damper to close, cooling of the spring loosens the coil and allows the controlling damper to open. Position of the control arm sets the tension of the coil that determines how much heat is needed to cause the control damper to close.

Combustor: N/A

Internal Baffles: An internal baffle is not used; flame path is either directed through a bypass opening or through the refractory combustion chamber.

Other Features: A bypass is operated by a handle located on the right side of the firebox. The ash pan is accessed through a door located under the front fuel loading door, a top fuel loading door is in the stove top. Optional blower is a Fasco Transflow model 55416-25350 (70582460B), rated at 120 CFM

Flue Outlet: The 6" diameter flue outlet is located in the top rear of the unit.

WOOD HEATER OPERATING INSTRUCTIONS

Specific Written Instructions: See Section 5 of this report. All markings and instruction materials were reviewed for content prior to printing.

Labeling & Owner’s Manual

MODEL / MODÈLE: "Duantless FlexBurn Catalytic / Non-Catalytic"
LISTED SOLID FUEL ROOM HEATER BURNING FIREPLACE STOVE
HOMOLOGUE POELE A COMBUSTIBLE SOLIDES

Serial No.
N° de série: **HF**

BARCODE LABEL

Report #/Rapport # 0061WS104E, 0061WS104S

Tested to / Testé à: ASTM E2515, ASTM E3053, UL 1482-2011, ULC-S627-00, CAN/CSA B415.1.

Install and use only in accordance with manufacturer's installation and operation instructions. Contact local building or fire officials about restrictions and installation inspection in your area. Install only with legs provided in accordance with installation instructions.

WARNING: Risk of flame and smoke spillage. Do not obstruct the space beneath the heater.

Fuel: Use with solid wood fuel only. Do not burn other fuels.

Build a fire directly on hearth only. Do not elevate fire. Keep doors fully closed or fully open while operating.

Chimney: Use a minimum 6" diameter factory built high temperature (H.T.) chimney which is listed to UL-103-1985 (2100°F) or 8" X 8" nominal or larger approved masonry chimney with flue liner.

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

Chimney Connector: Use a minimum 6" diameter 24 gauge chimney connector. Install chimney connector at least 18" from ceiling. Refer to local building codes and Vermont Castings Owner's Guide for precautions for passing a chimney or chimney connector through a combustible wall or ceiling.

Floor Protection U.S.: With the Vermont Castings Bottom Heat Shield installed most installations require an approved hearth pad. The Dauntless was test using a 1/2" (13mm) non-combustible hearth material with a thermal conductivity, (k) = 0.47 BTU-in/hr ft²·°F, resulting in the requirement of providing total thermal resistance (R) of 1.06. (Cover with material if desired). The floor protector is required under the stove and must extend 16" from the front, 6" from the rear and sides. It must extend under the chimney connector and 2" to either side. Without Vermont Castings Bottom Heat Shield, only installations over a totally non-combustible floor such as unpainted concrete over earth are acceptable. UL 737 Doors open require 1" floor protection.

Floor Protection Canada: Operate only with Vermont Castings Bottom Heat Shield in place. When installed on a combustible floor, the Dauntless was tested using a 1/2" (13mm) non-combustible hearth material with a thermal conductivity, (k) = 0.47 BTU-in/hr ft²·°F, resulting in the requirement of providing total thermal resistance (R) of 1.06. (Cover with decorative non-combustible material if desired).The floor protection must extend 450mm (18in.) to the front and 200mm (8in.) to the front and 200mm (8in.) to the sides and rear. Do not obstruct the space under the heater.

Optional Components: Fan Kit Part No. 1-10-586167. 115V 60Hz 1.1 FLA

Replace glass only with Vermont Castings 5mm ceramic glass.

Do not remove or cover this label. Catalytic Combustor Part No. 30007430

CAUTION: Burning of materials other than the specified fuels may make the Catalyst in the combustor inactive. The combustor is fragile, handle carefully. The performance of the catalytic device or it's durability have not been evaluated as part of the certification.

Combustion air cannot be obstructed.

Damper must be open before opening doors.

Do not overfire. Glowing parts indicate overfiring.

The space heater must be installed with the legs provided, attached as shown in the installation instructions.

Installer conformément aux instructions du fabricant. Contacter les autorités locates pour connaître les restrictions et inspections nécessaires. N'installer que les pattes qui sont incluses, en conformité avec les instructions du fabricant.

Ne pas obstruer l'espace sous le poele.

Attention: Risque de flammes et de fumée spilage. Ne pas obstruer l'espace sous le chauffe-eau.

Le registre doit être ouvert avant d'ouvrir les portes.

Combustible: N'utiliser que du bois comme combustible. Ne pas utiliser d'autres types de combustible. Inspecter et nettoyer la cheminée fréquemment - Sous certainesusages, l'accumulation de créosote peu se produire rapidement. Garder les portes toutes fermées ou toutes ouvertes durant l'opération.

Faire le feu directement sur la grille prévue à cet effet. Laisser les portes du poêle soit complètement ouverts ou complètement fermées lors de l'utilisation. Ne pasraccorder le conduit de cheminée du poêle à une cheminée servant à d'autres appareils. N'utiliser que les vitres de céramique Vermont Castings en cas de remplacement de celles-ci.

Protection plancher Canada: fonctionner uniquement avec Vermont Castings écran thermique inférieur en place. Lorsqu'il est installé sur un plancher combustible, le Encore 2010 a été testé en utilisant un 1/2 "(13mm) de matériau de âtre non-combustible avec une conductivité, (k) = 0,47 BTU-in / hr ft²- °F, ce qui entraîne l'obligation de providinga résistance thermique totale (R) de 1,06. (Couvrir avec un matériau non-combustible décorative si désiré) .La protection de plancher doit se prolonger 450mm (18po.) À l'avant et 200 mm (8 po.) À l'avant et 200 mm (8 po.) Sur les côtés et à l'arrière. Ne pas obstruer l'espace sous le poêle.

Accessories disponibles au Canada: Kit de ventilateur numéro de pièce 1-10-586167

Catalyseur pièce no. 30007430

Replacer uniquement qu'avec une glace 5mm Vermont Castings.

Attention: Bruler des matières autres que celles spécifiées pourrait rendre le caralyseur inactif.

Attention: Le catalyseur est fragile, manipulaer avec soin.

US ENVIRONMENTAL PROTECTION AGENCY

Certified to comply with 2020, particulate emissions standards using cord wood at 1.1 g/hr (without catalyst) and 1.2 g/hr (catalytic). This wood heater contains a catalytic combustor which needs periodic inspection and replacement 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 operating instructions in the Owner's Manual.

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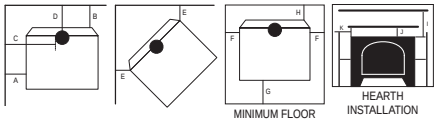
*Less than 3/4" (19mm) protrusion. For additional types of installations and clearances consult your Owner's Manual. Por autres modes d'installation et degagement supplementaires, consultz votres manual du proprietaire.

Most vertical installations require a ceiling heat shield and a flue collar heat shield to be installed. Consult your Owner's Manual.

MINIMUM CLEARANCES TO COMBUSTIBLE CONSTRUCTION /
MINIMUM DE DEGAGEMENT JUSQU'A LA CONSTRUCTION COMBUSTIBLE



MINIMUM FLOOR PROTECTION

HEARTH INSTALLATION

VERMONT CASTINGS

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

A = Unit to Sidewall	19"
B = Unit to Backwall	20"
C = Chimney Connector to Sidewall	29"
D = Chimney Connector to Backwall	21"
E = Unit to Adjacent Wall	18-1/2"
F = Sides (Floor Protection)	6"
G = Front to Glass (Floor Protection)	16"
H = Rear (Floor Protection)	6"
I = Top to Bottom of Mantel	22"
J = Top to Bottom of Top Trim*	28"
K = Edge of Top to Side Wall	21"

A = Entre le mur lateral et l'appareil	483mm
B = Entre le mur arriereet l'appareil	508mm
C = Entre le tuyau et le mur lateral	737mm
D = Entre le tuyau et le mur arriere	534mm
E = Entre le mur adjacent et l'appareil	470mm
F = Côtes (la protection de plancher)	203mm
G = Devant, par rapport au verr	457mm
H = Arriére (la protection de plancher)	203mm
I = De haut en bas de Mantel	556mm
J = De haut en bas de la moulure supérieure*	712mm
K = Edge of Haut de paroi latérale	534mm

CAUTION:HOT WHILE IN OPERATION- DO NOT TOUCH- KEEP CHILDRENAND CLOTHING AWAY- CONTACT MAY CAUSE SKIN BURNS- SEE NAMEPLATEANDINSTRUCTIONS.KEEPFURNISHINGSANDOTHERCOMBUSTIBLE MATERIALS A CONSIDERABLE DISTANCE AWAY FROM THE APPLIANCE.

ATTENTION:CHAUD LORS DU FONCTIONNEMENT- NE TOUCHEZ PAS L'APPAREIL-GARDEZ LES ENFANTS ET LES VÊTEMENTS ÉLOIGNÉS- TOUT CONTACT PEUT ENTRAÎNER DES BRÛLURES DE LA PEAU. RÉFÉREZ-VOUS À LA PLAQUE SIGNALÉTIQUE ET AU MODE D'EMPLOI. GARDEZ LE MOBILIER ET LES AUTRES MATÉRIAUX COMBUSTIBLES BIEN À L'ÉCART DE L'APPAREIL.

Date of Manufacture / Date de fabrication:

2019	2020	2021	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

Manufactured by / Fabriqué par: Hearth and Home Technologies 352 Mountain House Road, Halifax PA 17032

3-90-586190_R1

LABEL TICKET			
ECO:	88631	**LABEL SIZE:**	6.5" H x 11" W
PART # / REV:	3-90-586190_R1	**ADHESIVE:**	
ORIGINATOR:	Spidlet	**MATERIAL:**	24 Gauge Aluminum
DATE:	03/05/19	**INK:**	Black Background Aluminum Lettering
VERMONT CASTINGS 352 Mountain House Road Halifax, PA 17032		(4) Slotted Holes = .156 x .25 Barcode label must have the serial number on it. The barcode label must be able to read Code 39 Full ASCII.	

Owner's Manual
Operation & Care

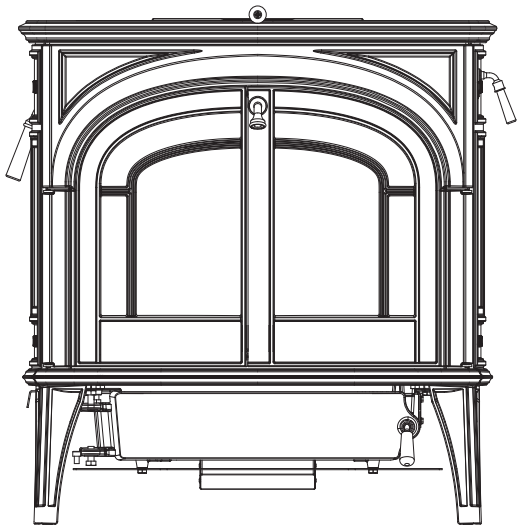
INSTALLER: Leave this manual with party responsible for use and operation.
OWNER: Retain this manual for future reference.

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

NOTICE: SAVE THESE INSTRUCTIONS

VERMONT CASTINGS

Dauntless FlexBurn® Wood Stove



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

hearthED FACTORY TRAINING Fuel Your Fire

NFI NATIONAL FIREPLACE INSTITUTE A CERTIFICATION AGENCY

⚠ WARNING

If the information in these instructions is not followed exactly, a fire may result causing property damage, personal injury, or death.

- Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.
- Do not over fire - If appliance or chimney connector glows, you are over firing. Over firing will void your warranty.
- Comply with all minimum clearances to combustibles as specified. Failure to comply may cause house fire.

⚠ WARNING

HOT SURFACES!
Glass and other surfaces are hot during operation AND cool down.
Hot glass will cause burns.

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

NOTE

To obtain a French translation of this manual, please contact your dealer or visit www.vermontcastings.com

Pour obtenir une traduction française de ce manuel, s'il vous plaît contacter votre revendeur ou visitez www.vermontcastings.com

Congratulations on your choice of a Vermont Castings Dauntless FlexBurn® Wood Stove. At Vermont Castings we take American craftsmanship seriously. We assure you that your cast-iron Vermont Castings stove has been made with the utmost care and will provide you with many years of service.

As you become acquainted with your new stove, you will find that its appearance is matched by its functionality, due to cast iron's unique ability to absorb and radiate heat.

Also, Vermont Castings products are among the cleanest-burning wood stoves available today. However, clean burning depends on both the manufacturer and the operator. Please read this manual carefully to understand how to properly operate and maintain your stove.

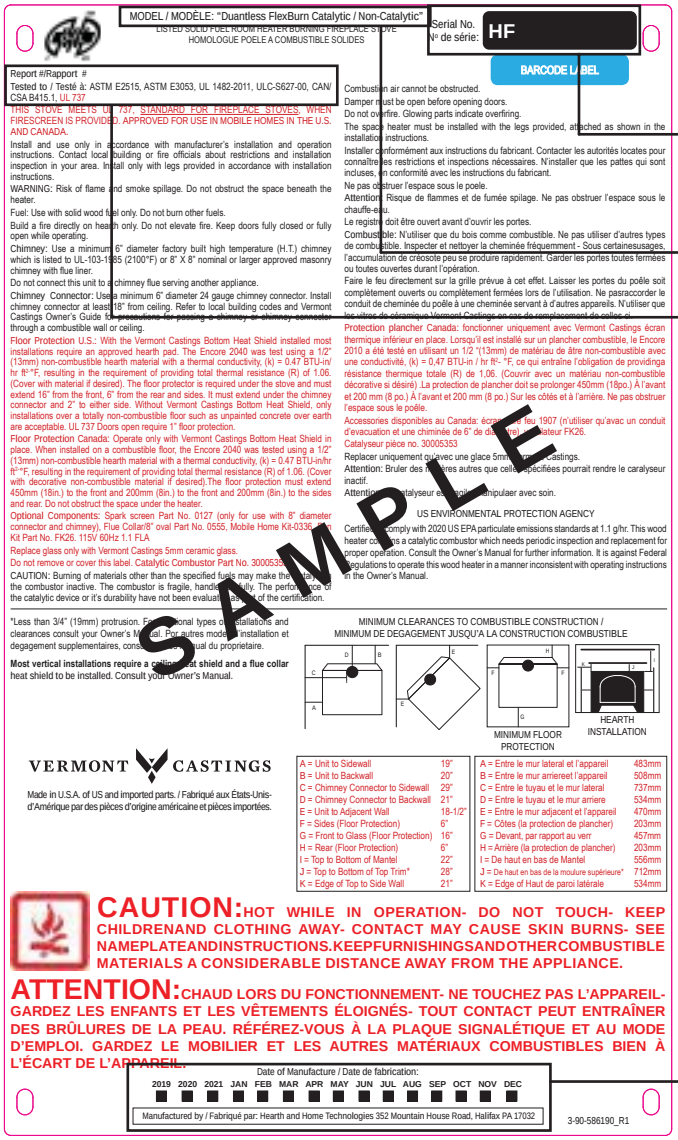
At Vermont Castings, we are committed to your satisfaction as a customer. That is why we maintain an exclusive network of the finest dealers in the industry. Our dealers are chosen for their expertise and dedication to customer service. Feel free to contact your Authorized Vermont Castings Dealer anytime you have a particular question about your stove or its performance.

This manual contains valuable instructions on the operation of your Vermont Castings Dauntless FlexBurn® Wood Stove. It also contains useful information on maintenance. Please read the manual thoroughly and keep it as a reference.

This heater meets the U.S. Environmental Protection Agency's emission limits for wood heaters sold on or after May 15, 2020.

Please read this entire manual before you install and use your new stove. Failure to follow instructions may result in property damage, bodily injury, or even death.

Proposition 65 Warning: Fuels used in gas, wood burning or oil fired appliances, and the products of combustion of such fuels, contain chemicals known to the State of California to cause cancer, birth defects and other reproductive harm.
California Health & Safety Code Sec. 25249.6



Serial No.

Model Name

Test Lab & Report No.

Mfg. Date

⚠ Safety Alert Key:

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

TABLE OF CONTENTS

➔ = Contains updated information

A. Warranty Policy

Hearth & Home Technologies
LIMITED LIFETIME WARRANTY

Hearth & Home Technologies, on behalf of its hearth brands ("HHT"), extends the following warranty for HHT gas, wood, pellet and electric hearth appliances that are purchased from an HHT authorized dealer.

WARRANTY COVERAGE:

HHT warrants to the original owner of the HHT appliance at the site of installation, and to any transferee taking ownership of the appliance at the site of installation within two years following the date of original purchase, that the HHT appliance will be free from defects in materials and workmanship at the time of manufacture. After installation, if covered components manufactured by HHT are found to be defective in materials or workmanship during the applicable warranty period, HHT will, at its option, repair or replace the covered components. HHT, at its own discretion, may fully discharge all of its obligations under such warranties by replacing the product itself or refunding the verified purchase price of the product itself. The maximum amount recoverable under this warranty is limited to the purchase price of the product. This warranty is subject to conditions, exclusions and limitations as described below.

WARRANTY PERIOD:

Warranty coverage for consumers begins at the date of installation. In the case of new home construction, warranty coverage begins on the date of first occupancy of the dwelling or six months after the sale of the product by an independent, authorized HHT dealer/ distributor, whichever occurs earlier. However, the warranty shall commence no later than 24 months following the date of product shipment from HHT, regardless of the installation or occupancy date. The warranty period for parts and labor for covered components is produced in the following table.

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

Warranty Period		**HHT Manufactured Appliances and Venting**					
Parts	Labor	Gas	Pellet	Wood	Electric	Venting	Components Covered
1 Year		X	X	X	X	x	All parts and material except as covered by Conditions, Exclusions, and Limitations listed
2 years			**X**	**X**			Igniters, auger motors, electronic components, and glass
		X	**X**	**X**			Factory-installed blowers
				X			Molded refractory panels
		X					Ignition Modules
3 years			**X**				Firepots, burnpots, mechanical feeders/auger assemblies
5 years	1 year	**X**					Vent Free burners, Vent Free ceramic fiber logs, Aluminized Burners
			X	**X**			Castings and Baffles
6 years	3 years			**X**			Catalyst - limitations listed
7 years	3 years		**X**	**X**			Manifold tubes, HHT chimney and termination
10 years	1 year	**X**					Burners, logs and refractory
Limited Lifetime	3 years	**X**	**X**	**X**			Firebox and heat exchanger, Grate and Stainless Steel Burners, FlexBurn® System (engine, inner cover,access cover and fireback)
90 Days		**X**	**X**	**X**	**X**	**X**	All replacement parts beyond warranty period

WARRANTY CONDITIONS:

- This warranty only covers HHT appliances that are purchased through an HHT authorized dealer or distributor. A list of HHT authorized dealers is available on the HHT branded websites.
- This warranty is only valid while the HHT appliance remains at the site of original installation.
- This warranty is only valid in the country in which the HHT authorized dealer or distributor that sold the appliance resides.
- Contact your installing dealer for warranty service. If the installing dealer or distributor is unable to provide necessary parts, contact the nearest HHT authorized dealer or supplier. Additional service fees may apply if you are seeking warranty service from a dealer other than the dealer from whom you originally purchased the product.
- Check with your dealer in advance for any costs to you when arranging a warranty call. Travel and shipping charges for parts are not covered by this warranty.
- Limited Catalyst Warranty
    - o For wood burning products containing a catalyst, the catalyst will be warranted for a six-year period as follows: if the original catalyst or a replacement catalyst proves defective or ceases to maintain 70% of its particulate emission reduction activity (as measured by an approved testing procedure) within 36 months from the purchase date, the catalyst will be replaced for free.
    - o From 37 to 72 months a pro-rated credit will be allowed against a replacement catalyst and labor credit necessary to install the replacement catalyst. The proration rate is as follows:

Amount of Time Since Purchase	Credit Towards Replacement Cost
0 - 36 Months	100%
37 - 48 Months	30%
49 - 60 Months	20%
61 - 72 Months	10%

    - o Any replacement catalyst will be warranted under the terms of the catalyst warranty for the remaining term of the original warranty. The purchaser must provide the name, address, and telephone number of the location where the product is installed, proof of original purchase date, date of failure, and any relevant information regarding the failure of the catalyst.

WARRANTY EXCLUSIONS:

This warranty does not cover the following:

- Changes in surface finishes as a result of normal use. As a heating appliance, some changes in color of interior and exterior surface finishes may occur. This is not a flaw and is not covered under warranty.
- Damage to printed, plated, or enameled surfaces caused by fingerprints, accidents, misuse, scratches, melted items, or other external sources and residues left on the plated surfaces from the use of abrasive cleaners or polishes.
- Repair or replacement of parts that are subject to normal wear and tear during the warranty period are not covered. These parts include: paint, wood and pellet gaskets, firebricks, grates, flame guides, batteries and the discoloration of glass.
- Minor expansion, contraction, or movement of certain parts causing noise. These conditions are normal and complaints related to this noise are not covered by this warranty.
- Damages resulting from: (1) failure to install, operate, or maintain the appliance in accordance with the installation instructions, operating instructions, and listing agent identification label furnished with the appliance; (2) failure to install the appliance in accordance with local building codes; (3) shipping or improper handling; (4) improper operation, abuse, misuse, continued operation with damaged, corroded or failed components, accident, or improperly/incorrectly performed repairs (5) environmental conditions, inadequate ventilation, negative pressure, or drafting caused by tightly sealed constructions, insufficient make-up air supply, or handling devices such as exhaust fans or forced air furnaces or other such causes; (6) use of fuels other than those specified in the operation instructions; (7) installation or use of components not supplied with the appliance or any other components not expressly authorized and approved by HHT; (8) modification of the appliance not expressly authorized and approved by HHT in writing; and/or (9) interruptions or fluctuations of electrical power supply to the appliance.
- Non-HHT venting components, hearth connections or other accessories used in conjunction with the appliance.
- Any part of a pre-existing fireplace system in which an insert or a decorative gas appliance is installed.
- HHT's obligation under this warranty does not extend to the appliance's capability to heat the desired space. Information is provided to assist the consumer and the dealer in selecting the proper appliance for the application. Consideration must be given to the appliance location and configuration, environmental conditions, insulation and air tightness of the structure.

This warranty is void if:

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

LIMITATIONS OF LIABILITY

- The owner's exclusive remedy and HHT's sole obligation under this warranty, under any other warranty, express or implied, or in contract, tort or otherwise, shall be limited to replacement, repair, or refund, as specified above. In no event will HHT be liable for any incidental or consequential damages caused by defects in the appliance. Some states do not allow exclusions or limitation of incidental or consequential damages, so these limitations may not apply to you. This warranty gives you specific rights; you may also have other rights, which vary from state to state. EXCEPT TO THE EXTENT PROVIDED BY LAW, HHT MAKES NO EXPRESS WARRANTIES OTHER THAN THE WARRANTY SPECIFIED HEREIN. THE DURATION OF ANY IMPLIED WARRANTY IS LIMITED TO DURATION OF THE EXPRESSED WARRANTY SPECIFIED ABOVE.

1 Product Listing and Important Safety Information

A. Appliance Certification

MODEL:	Dauntless FlexBurn® Wood Stove
LABORATORY:	OMNI Test Laboratories, Inc
REPORT NO.	0061WS104E, 0061WS104S
TYPE:	Solid Fuel Type Room Heaters
STANDARD(s):	ASTM E2515, ASTM E3053, UL-1482, ULC-S627, B415.1

B. BTU & Efficiency Specifications

EPA Report #:	(without catalyst) (catalytic)
EPA Certified Emissions:	1.1 g/hr (without catalyst) 1.2 g/hr (catalytic)
***LHV Tested Efficiency:**	81.6% (without catalyst) 82.6% (catalytic)
****HHV Tested Efficiency:**	76.9% (without catalyst) 77.9% (catalytic)
*****EPA BTU Output:**	12,250 - 49,430 (without catalyst)
	14,520 - 41,940 (catalytic)
******Peak BTU/Hour Output:**	54,100 (without catalyst) 48,300 (catalytic)
Vent Size:	6 Inch (152 mm)
Firebox Size:	1.8 cu. ft.
Recommended Length:	16”
Max. Wood Length:	18”
Fuel Orientation:	East, West
Fuel	Seasoned Cordwood (20% moisture)
*Weighted average LHV efficiency using Douglas Fir dimensional lumber and data collected during EPA emissions test.	
****Weighted average HHV efficiency using Douglas Fir dimensional lumber and data collected during EPA emissions test.	
*****Efficiencies are based on test results calculated using B415; these calculated efficiencies are then used to calculate output BTU’s.	
******A peak BTU out of the appliance calculated using the maximum first hour burn rate from the High EPA Test and the BTU content of cord wood (8600) times the efficiency.	

The Vermont Castings Dauntless FlexBurn® Wood Appliance meets the U.S. Environmental Protection Agency Certified to comply with the 2020 particulate emission standards using cord wood.

C. California

WARNING

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

D. Mobile Home Approved (USA ONLY)

- This appliance is approved for mobile home installations in the USA when not installed in a sleeping room and when an outside combustion air inlet is provided.
- The structural integrity of the mobile home floor, ceiling, and walls must be maintained.
- The appliance must be properly grounded to the frame of the mobile home with #8 copper ground wire, and chimney must be listed to UL103 HT or a listed UL-1777 full length six inch (152mm) diameter liner must be used.
- Mobile Home Bracket Kit, part #0003264 must be installed in a mobile home installation.

E. Glass Specifications

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

⚠ WARNING

Fire Risk.

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

- Installation and use of any damaged appliance.
- Modification of the appliance.
- Installation other than as instructed by Hearth & Home Technologies.
- Installation and/or use of any component part not approved by Hearth & Home Technologies.
- Operating appliance without fully assembling all components.
- Operating appliance without legs attached (if supplied with appliance).
- Do NOT Overfire - If appliance or chimney connector glows, you are overfiring.

Any such action that may cause a fire hazard.

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

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

In the United States it is against the law to operate this wood heater in a manner inconsistent with the operating instructions in this manual.

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

2 Operating Instructions

A. The Dauntless FlexBurn® Controls

Two controls regulate the performance of the Dauntless FlexBurn®: a **primary air control** supplies oxygen for the fire, and a **damper** directs air flow within the stove to activate and deactivate the combustion system, Figure 2.1.

Symbols on the stove are reminders of the correct directions for using the controls. The words 'Left' and 'Right' in these directions are *facing the stove*.

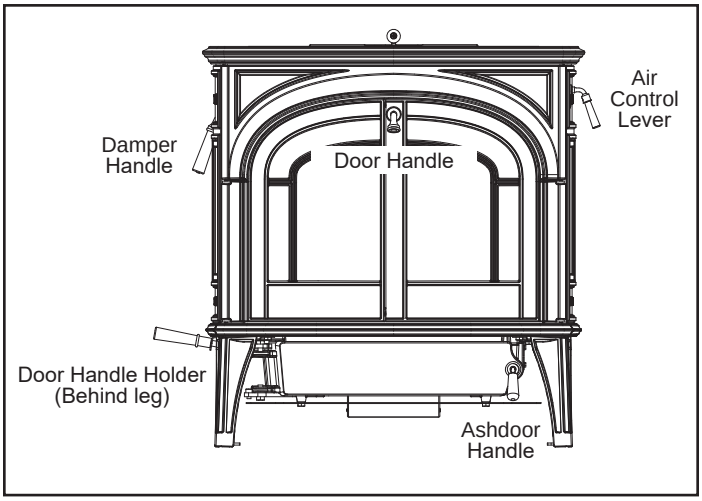


Figure 2.1 - The Dauntless FlexBurn® controls are conveniently located and easy to operate.

A Single Air Control Regulates Heat Output and Burn Time

The **primary air control lever**, on the right of the stove, controls the amount of incoming air for starting, maintaining, and reviving a fire.

Once the air control is manually set, a bi-metallic thermostat automatically maintains the heat output at a constant level for a more even heat over the life of the burn.

More air entering the stove makes the fire burn hotter and faster, while less air prolongs the burn at a lower heat output level.

For the greatest air supply and maximum heat output (but the shortest burn time), move the lever toward the front of the stove. For a fire that will last longer with less heat, move the lever toward the rear of the unit, Figure 2.2.

⚠ WARNING

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

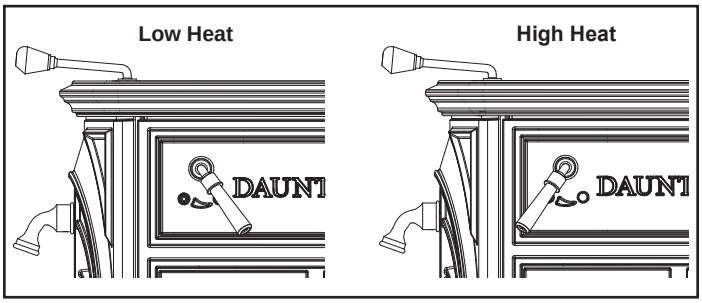


Figure 2.2 - The handle may be positioned anywhere between the two extremes for different heat levels.

A Damper Directs Air Flow Within the Stove

The **damper handle** on the left side of the stove operates the damper to direct air flow within the stove.

The damper is **open** when the handle points to the **rear**, enabling smoke to pass directly into the chimney. The damper must be open when starting or reviving a fire, and whenever the griddle or doors are opened.

The damper is **closed** when the handle points **down.** Smoke travels through the secondary combustion system where it can be further burned, before passing up the chimney, Figure 2.3.

The damper should always be either fully open or fully closed. There are no intermediate positions. When closing the damper, be sure to pull firmly enough to snap the handle into the locked position.

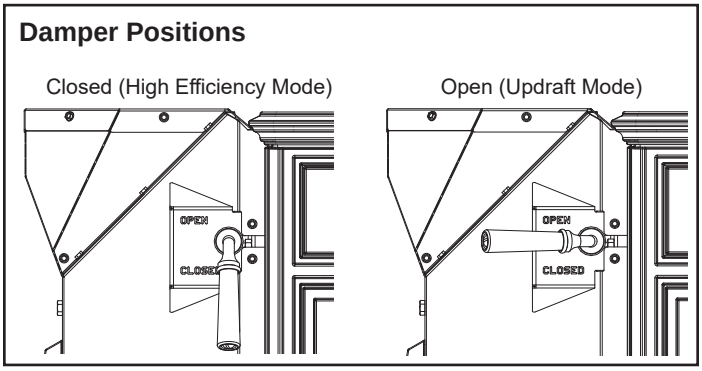


Figure 2.3 - The damper is either open or closed. There are no intermediate positions.

B. Conditioning Your Stove

Cast iron is extremely strong, but it can be broken with a sharp blow from a hammer or from the thermal shock of rapid and extreme temperature change.

The cast plates expand and contract with changes in temperature. When you first begin using your Dauntless FlexBurn®, minimize thermal stress by letting the plates adjust gradually during three or four initial break-in fires.

C. Wood Burning Operation

Burn only solid wood in the Dauntless FlexBurn® Wood Stove, and burn it directly on the grate. Do not elevate the fuel. Do not burn coal or other fuels. In the United States, it is against the law to operate this wood heater in a manner inconsistent with operating instructions in this manual.

The bypass damper must be open when starting a fire or when refueling.

Do not use chemicals or fluids to start the fire. Do not burn garbage. Never use flammable fluids such as gasoline, gasoline type lantern fuel, kerosene, charcoal lighter fluid, naptha, engine oil or similar liquids to start or "freshen up" a fire in this heater. Keep all such liquids well away from the heater while it is in use.

The following procedures are important for reliable, clean and efficient operation of your woodstove. Recommend 16" logs Properly seasoned (up to a year for denser woods) Split to 3" to 6" cross sections

Cold start:

When starting your stove at room temperature and when no burning coals are present the following kindling procedure has been found to be the most reliable.

Stack about 4 lbs of finely split kindling (1" diameter or less 10 to 20 pcs) in a 'log cabin' style directly against the rear wall. Place a small amount of newspaper on top of this pile with one or two small pieces of kindling on top. This is referred to as a top down method and while providing a slower start, also serves to preheat the combustion properly resulting in a reliable start., Figure 2.4.

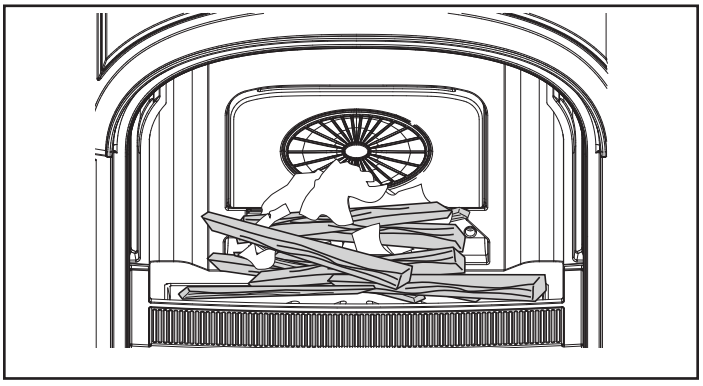


Figure 2.4 - Start the fire with newspaper and dry kindling.

With the bypass damper open and the primary air set to its highest position, light the newspaper. Leave the front door cracked until the kindling ignites, then close the doors.

After most of the kindling has burned into coals (15 to 20 minutes), open the front doors and push remaining coals and unburned wood against the rear wall. Add several pieces of larger split wood between 2 to 3 inches in diameter (about 6 lbs) directly against the rear wall and on top of the kindling coals. Close the doors and bypass to engage the combustion system. The air should remain on high for up to one hour or until the wood is mostly converted to coals.

After a hot bed of coals is produced, open the door and bypass damper and push the remaining coals again toward the rear wall. Add large pieces of wood starting against the rear wall and on top of the coals. Close the doors and bypass immediately after loading the stove.

Ideally, allow this wood load to burn at the highest air setting for the entire wood load. If this is not possible, the wood should burn for at least 30 minutes prior to reducing the primary air setting.

D. Ways to Add Fuel

To open the front doors, insert the handle into the door latch stub and turn it clockwise, Figure 2.5.

To close them, always close the left door first. Turn the handle in the right door to the left and up (to the open position) and close it. Finally, push on the door as you turn the handle counterclockwise. The doors will draw in slightly, and the handle should offer some resistance as you turn it to the closed position.

To reduce the risk of breaking the glass, avoid striking the glass or slamming the doors.

When you are not using the door handle, store it in the holder behind the left front leg of the stove.

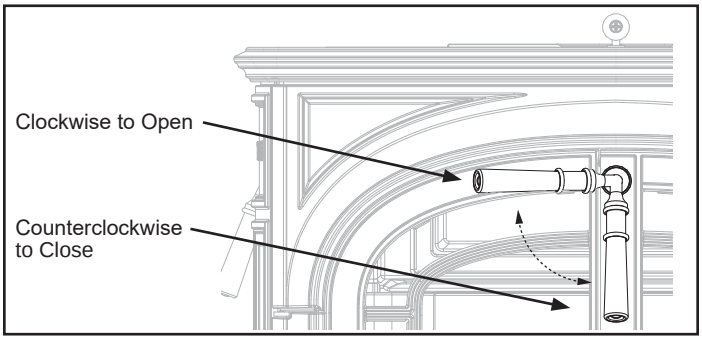


Figure 2.5 - To open the front doors, turn the handle clockwise.

For best results when refueling, wear long-cuffed stove gloves to protect your hands and forearms.

Reloading a hot stove:

When a wood load is added to a hot bed of coals (continuous use), open the bypass damper and either the top or front loading doors. Stir the hot coals to allow ash to fall through the grate. Hot coals should then be pushed against the rear wall and leveled depending on the amount of coals. Add fresh wood and close the loading door and bypass damper. If the coals are glowing and hot, it is possible to set the air control to any setting immediately after loading the stove.

Reloading a warm stove:

If the stove is relatively cold (for instance after a long overnight burn), the coal bed may need to be re-energized prior to adding a large load of wood. Open the bypass damper and either the top or front loading door. Stir the coals to allow ash to fall through the grate. Push the remaining coals toward the rear wall. Close the door(s) and bypass damper and set the primary air to the highest position. Allow the coals to re-ignite and heat the system for 10 to 15 minutes. Once the coals are glowing, a fresh batch of wood may be added following the “hot stove” procedure above.

A proper bed of coals is critical to the performance of the Dauntless stove. The rear refractory wall of the stove should be almost entirely white in color with proper operation. This indicates the combustion system is running at a proper elevated temperature. If the rear wall is black with creosote or develops a dark brown color, it is likely that the coal bed is not sufficiency large enough or hot enough. Revisit the above instructions and adjust the amount of kindling or time at high air settings to get the system hotter. Wood size or excessive moisture may also cause lower than desirable stove temperatures.

While not required, operating your stove with the catalytic combustor installed creates optimum conditions for secondary combustion and will increase your efficiency up to 15% on low burn, making sure you get the most heat out of each load of wood.

The catalytic element is a metal “honeycomb” coated with the catalytic material. The element sits at the bottom of the secondary combustion chamber. Smoke, gases and particulates that are not fully combusted during the secondary combustion process pass through the catalyst, creating a tertiary burn. This results in higher efficiency and lower emissions.

The catalyst will initiate combustion of smoke and particulates at 500° - 600°F (260° - 315°C), half the temperature normally required for unaided secondary combustion. If you followed the startup operation steps in the previous section the stove will be sufficiently hot to allow the combustor to work. Once the combustor starts working, heat generated by burning the smoke will keep it working.

To determine whether the combustor is operating, refer to the temperature probe which shows the operating range of the catalytic combustor. This is located on the back of the stove and is viewed from the top.

NOTE: It will take several minutes after closing the bypass damper for the temperature probe to fully adjust to the new temperature. If the probe indicator is below the operate catalyst range, add fuel or open the bypass damper to allow the fire to further build before engaging the catalyst again.

If the probe indicator is above the operate catalyst range, the catalytic combustor is running too hot and may be damaged. In many cases, decreasing the primary air can reduce the catalyst temperature and adding less wood with each loading can also help if overheating is persistent. Do not add wood to the stove if the probe reads above the operate catalyst range.

Avoid using a full load of very dry wood in the firebox, such as dry slab wood or wood with below 14% moisture content. This may result in continuous very high temperatures in the secondary combustion area and damage the combustor.

Never burn treated wood, garbage, solvents or trash. All of these may poison the catalyst and prevent it from operating properly. Never burn cardboard or loose paper except for kindling purposes. Never burn coal; doing so can produce soot or large flakes of char or fly ash that can coat the combustor and cause smoke to spill into the room. Coal smoke can also poison the catalyst so that it won’t operate properly.

NOTE: The metal catalytic combustor is fragile and will crack if subjected to thermal shock. Thermal shock can occur when refueling with wet wood or closing the bypass damper too early after refueling.

⚠ WARNING

DO NOT OPERATE THE STOVE WITH THE ASH DOOR OPEN. OPERATION WITH THE ASH DOOR OPEN CAN CAUSE AN OVER-FIRING CONDITION TO OCCUR. OVER-FIRING THE STOVE IS DANGEROUS AND CAN RESULT IN PROPERTY DAMAGE, INJURY OR LOSS OF LIFE.

Andirons Help Protect the Glass
Your stove has andirons to keep logs away from the glass panels. The andirons are essential to maintain clear fire viewing, and should be left in place. Since the andirons may slightly hinder refueling through the front doors, most stove owners will prefer the convenience of top loading through the griddle. Do not place fuel between the andirons and the doors.

Burn Only High-Quality Wood
The Dauntless FlexBurn® is designed to burn natural wood only; do not burn fuels other than that for which it was designed.

IMPORTANT: Do not burn any type of artificial or synthetic materials such as fire starter logs (containing wax) in this appliance. Never burn liquid-based fuels such as kerosene, gasoline or alcohol.

Burning any materials not allowed in these instructions, or over-firing the stove, may void the warranty.

You'll enjoy the best results when burning wood that has been adequately air-dried. The wood should be 16" - 18" (406-457 mm) in length. Avoid burning "green" wood that has not been properly seasoned. (**Note:** Properly seasoned firewood has a moisture content below 20 percent.) Do not burn construction materials; they often contain chemicals and metals that can damage the inside surfaces of the stove and pollute the air. Do not burn ocean driftwood; when it burns, the salt it contains will attack the cast iron.

The best hardwood fuels include oak, maple, beech, ash, and hickory that has been split, stacked, and air-dried outside under cover for at least one year.

If hardwood is not available, you can burn softwoods that include tamarack, yellow pine, white pine, Eastern red cedar, fir, and redwood. These should also be properly dried.

Store split wood under cover to keep it dry. Even for short-term storage, be sure to keep wood a safe distance from the stove and keep it out of the areas around the stove used for refueling and ash removal.

Surface Thermometer is a Valuable Guide to Operation
An optional surface thermometer tells you when to adjust the air control, and when to refuel, Figure 2.8.

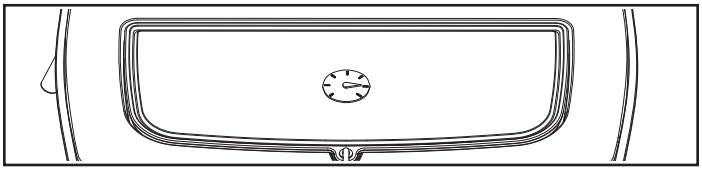


Figure 2.8 - Take temperature readings with a thermometer located in the middle of the griddle.

For example, when the thermometer registers at least 450°F (230°C) on the stove top after start-up you know the stove is hot enough and it may be time to close the damper if a sufficient ember bed has also been established. Note that the stove will warm up much sooner than the chimney, though; a warm chimney is the key to easy, effective stove operation. When thermometer readings drop below 350°F. (175°C) it's time to adjust the air control for a higher burn rate or to reload the stove. A temperature reading over 650°F. (340°C) is a sign to reduce the air supply to slow the burn rate.

Use the following temperature ranges as a guide:

- Readings in the 350°-500°F. (175°-260°C) range indicate low to medium heat output.
- 500°-600°F. (260°-315°C) readings indicate medium heat output.
- Readings of 600°-650°F. (315-340°C) indicate high heat output. Operating your Dauntless FlexBurn® continuously at griddle temperatures higher than 650° F (340°C) may damage the cast iron or enamel finish.

Use the Air Control Settings that Work Best for You
No single air control setting will fit every situation. Each installation will differ depending on the quality of the fuel, the amount of heat desired, and how long you wish the fire to burn; outdoor air temperature and pressure also affect draft.

The control setting also depends on your particular installation's "draft," or the force that moves air from the stove up through the chimney. Draft is affected by such things as the length, type, and location of the chimney, local geography, nearby obstructions, and other factors.

Too much draft may cause excessive temperatures in the Dauntless FlexBurn®, and could even damage the stove. On the other hand, too little draft can cause backpuffing into the room and/or the "plugging" of the chimney.

How do you know if your draft is excessively high or low? Symptoms of too much draft include an uncontrollable burn or a glowing-red stove part. Signs of weak draft are smoke leaking into the room through the stove or chimney connector joints or low heat output.

In some newer homes that are well-insulated and weather-tight, poor draft may result from an insufficient air supply in the house. In such instances, an open window near the stove on the windward side of the house can provide the combustion air supply needed.

Another option for getting more combustion air to the stove is to duct air directly from outside to the stove. In some areas provisions for outside combustion air are required in all new construction.

When first using the stove, keep track of the air control settings. You will quickly find that a specific setting will give you a fixed amount of heat. It may take a week or two to determine the amount of heat and the length of burn you should expect from various settings.

Most installations do not require a large amount of combustion air, especially if adequate draft is available. Do not for any reason attempt to increase the firing of your heater by altering the air control adjustment range outlined in these directions.

E. Ash Disposal

(Refer to the first page of the Operation section.)

DO NOT OPERATE THE STOVE WITH THE ASH DOOR OPEN. OPERATION WITH THE ASH DOOR OPEN CAN CAUSE AN OVER-FIRING CONDITION TO OCCUR. OVER-FIRING THE STOVE IS DANGEROUS AND CAN RESULT IN PROPERTY DAMAGE, INJURY OR LOSS OF LIFE.

Routine ash removal is important for ease of maintenance, and is important for the stove's durability. Remove ash before it reaches the top of the ash pan. Check the level at least once a day. Every few days, clear any ash from the outer edges of the firebox. Most of the ash will fall through the grate. Stir the ash with a shovel or poker so that it falls through the grate slots.

IMPORTANT: Check the level of ash in the ash pan before reloading the stove. If the ash level is close to the top edge of the pan, empty the pan according to this procedure:

- Open the damper.
- Open the griddle or front doors, and use a shovel or poker to stir excess ash through the ash slots in the grate down into the ash pan.
- Close the griddle or doors, and unlatch the ash door, Figure 2.9. It will pivot, swinging the ash pan out of the stove.

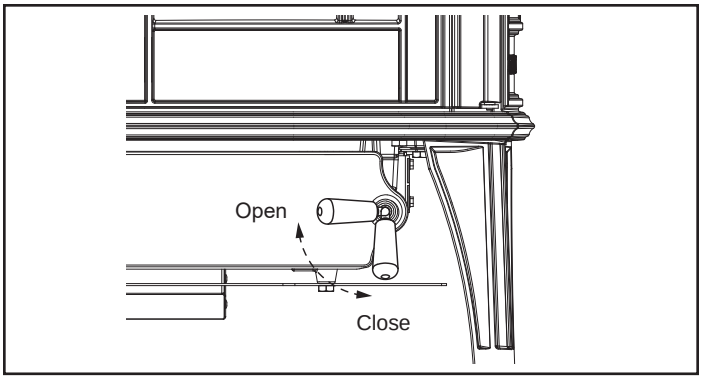


Figure 2.9- Turn the ashdoor handle clockwise to open and counterclockwise to close.

- Slide the cover onto the pan, making sure it is securely closed, Figure 2.10.

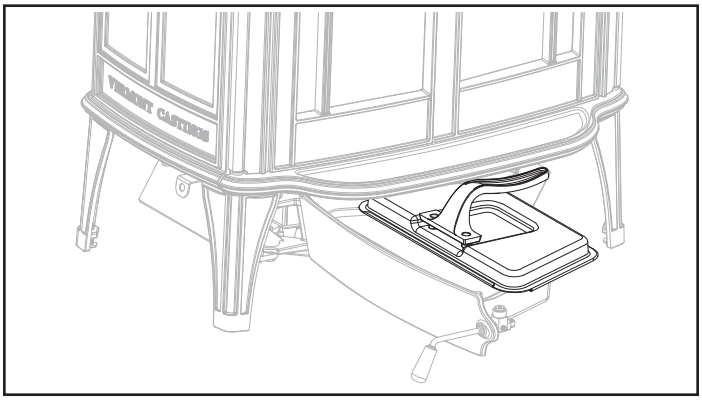


Figure 2.10 - Be sure the cover is securely attached before removing the ash pan.

- Remove the ash pan, making sure to keep it level.
- To keep the cover from sliding off and to keep ash from falling on the floor, do not tilt the ash pan forward.
- If the stove is in operation, close the ash door while disposing of the ash. You may need to lift the latch end of the door slightly to align the latch with the mating part on the stove bottom.
- Properly dispose of the ash in a metal container with a tight-fitting lid. Store the container outdoors away from all combustible material.
- Return the ash pan to its original position in the stove, and close and latch the ash door.

WARNING

Do not operate the stove with the ash door open. This will result in over-firing, and could cause damage to the stove, void the warranty, or even lead to a house fire.

Empty the ash pan regularly, typically every one to three days. The frequency will vary depending on how you operate your Dauntless FlexBurn®: ash will accumulate faster at higher heat outputs.

Removed ash should be placed outdoors in a metal container with a tight-fitting lid. Keep the closed container of ash on a noncombustible floor or on the ground, well away from all combustible materials, pending final disposal. If the ash is disposed of by burial in soil or otherwise locally dispersed, it should be kept in the closed container until all cinders have thoroughly cooled.

⚠ CAUTION

Never use your household or shop vacuum cleaner to remove ash from the stove; always remove and dispose of the ash properly.

F. Opacity (Visible Smoke)

This is the measure of how cleanly your appliance is burning. Opacity is measured in percent; 100% opacity is when an object is totally obscured by the smoke column from a chimney, and 0% opacity means that no smoke column can be seen. As you become familiar with your appliance, you should periodically check the opacity. This will allow you to know how to burn as nearly smoke-free as possible (goal of 0% opacity).

⚠ WARNING

Fire Risk

- DO NOT BURN GARBAGE OR FLAMMABLE FLUIDS SUCH AS GASOLINE, NAPTHA OR ENGINE OIL.
- Do NOT burn treated wood or wood with salt (driftwood).
- May generate carbon monoxide if burn material other than wood.

May result in illness or possible death.

⚠ WARNING

Fire Risk

Keep combustible materials, gasoline and other flammable vapors and liquids clear of appliance.

- Combustible materials may ignite.
- Do NOT store flammable materials in the appliance's vicinity.
- DO NOT USE GASOLINE, LANTERN FUEL, KEROSENE, CHARCOAL LIGHTER FLUID OR SIMILAR LIQUIDS TO START OR "FRESHEN UP" A FIRE IN THIS Appliance.
- Keep all such liquids well away from the appliance while it is in use.

⚠ CAUTION

When burning your first fire, you will experience smoke and odor from the appliance resulting from the curing of paint and burning off of any oils remaining from manufacturing.

OPEN WINDOWS DURING INITIAL BURN TO DISSIPATE SMOKE AND ODORS!

- Odors may be irritating to sensitive individuals.
- Smoke detectors may activate.

G. Negative Pressure

⚠ WARNING

Asphyxiation Risk

- Negative pressure can cause spillage of combustion fumes, soot and carbon monoxide.
- Appliance needs to draft properly for safety.

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

Causes include:

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

To minimize the effects of negative air pressure:

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

H. Important Information

Creosote is a by-product of slow wood-burning. It's an organic tar that can condense in the flue if it is present in the exhaust, slow-moving, and cools to less than 290°F (130°C). Condensed creosote is volatile, and can generate chimney fires if it gets hot enough. All the features that affect chimney draft also affect creosote condensation - so use whatever combination of installation features and operational steps that will encourage good draft and minimize creosote production.

Because letting the exhaust cool off and slow down is one of the keys to creosote accumulation, it makes sense to line a chimney to match the stove's outlet size, for safety reasons as well as performance. Canadian law requires a matching liner to serve any stove or insert vented through a fireplace chimney; in the US, the National Fire Protection Association (NFPA) recommends a chimney liner if the flue is more than three times bigger (in square area) than the outlet on the stove or insert. Some localities enforce the NFPA guidelines as part of their building codes.

Fuel: Even the best stove installation will not perform well with poor fuel. The best fuel is hardwood that has air-dried 12-18 months. Softwood burns, but not as long as hardwood. 'Green' wood contains a lot of moisture; it will burn, but some of the heat potential is used to boil the extra moisture from the wood. This reduces the amount of heat that reaches your home and can contribute to a creosote problem. There are moisture meters available for firewood; you can also judge your wood by its appearance and weight (Moisture content of 20% or less is best). If you get it green, lift a piece and get a sense of its weight; it can lose a third or more of its weight as it dries. Also look at the ends of a log; as it dries it shrinks and often cracks. The more weathered and cracked a piece is, the drier it is.

Dry wood burns readily with a good chimney draft. But with modern stoves, wood can be too dry and too volatile. Smoke and combustible gases can 'gas out' from the wood quickly and densely enough to overload the combustion system. If you hear a rumbling or roaring noise (like a propane torch) from the stove, that is a sign that the stove is over-firing.

Back-puffing results when the fire produces volatile gases faster than the chimney draft pulls them out of the firebox. The gases back up in the firebox until they are concentrated enough and hot enough to ignite. If your stove back-puffs, the stove needs to cool down. You should open the damper to let the smoke rise to the flue more quickly, allow more air into the firebox, avoid big loads of firewood and check that the wood moisture is not too low.

Draft Testing: An easy way to test your chimney draft is to close the stove's damper, wait a few minutes to let the airflow stabilize, then see whether you can vary the strength of the fire by swinging the air control open and closed. Results are not always instant; you may need to wait a few minutes for a change in the air control setting to have an effect on the fire. If there's no change, then the draft isn't strong enough yet to let you close the damper, and you'll need to open it for awhile longer and manage the fire with the air inlet until the draft strengthens. If you keep track of your burning habits and relate them to their effects on the stove's operation, you'll be rewarded with good performance and a safe system.

Conclusion: Wood-burning is an art rather than a science. Once the stove and chimney system are in place, you can only vary your technique, mostly your timing, to achieve good results. If you keep track of your burning habits and relate them to their effects on the stove's operation, you'll be rewarded with good performance and years of reliable heating.

3 Maintenance

Keep Your Stove Looking New and Working Its Best
Let the fire in the stove go out and allow the stove to cool completely before beginning any maintenance procedure.

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

Care of the Cast Iron Surface
An occasional dusting with a dry rag will keep the painted cast iron of your Dauntless FlexBurn® looking new.

The stove's paint can be touched up as needed. First, mask the areas, such as enameled parts, glass, or handles, around the spot to be painted. Clean the spot with a wire brush. Remove the griddle and set it aside. It is normal for the griddle to darken after use. You can clean it with a fine-bristle wire brush, or steel wool.

Then, touch up the stove with high temperature stove paint. Apply the paint sparingly; two light coats of paint are better than a single heavy one.

Care of the Porcelain Enamel Surface
Use a dry or slightly damp rag or soft brush to remove spills or stains. For difficult jobs that require a cleaning agent, use only a kitchen appliance cleaner or polish recommended for use on enamel surfaces.

If porcelain enamel becomes chipped or scratched during use, apply "enamel epoxy" to the damaged area and allow to dry. Once the epoxy has dried, sand the area to blend with surrounding area and apply appropriate color touch-up paint. Allow to dry completely before operating stove.

A. Cleaning the Glass & Replacement

Most of the carbon deposits on the glass will burn off during hot fires.

However, the ash residue that accumulates on the glass surface should be removed regularly to prevent etching. To clean the glass, follow this procedure:

- Be sure the glass is completely cool.
- Clean the glass with water or a cleaner made especially for this purpose. Do not use abrasive cleaners. Use cleaning agents sparingly and be sure to keep them off the outer surfaces of the stove.
- Rinse the glass thoroughly.
- Dry the glass completely.

Replace Broken Glass Immediately
Do not operate your stove if the glass in the doors is damaged.

If you need to replace the glass, use only the high temperature 5 mm ceramic glass supplied by Vermont Castings. Do not use substitutes.

Removing the Glass
1. Remove the right and left door assemblies by removing (4) 1/4-20 bolts located inside the door opening, Figure 3.1.

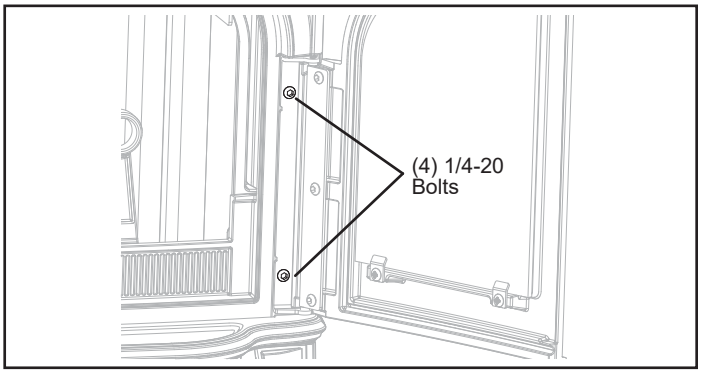


Figure 3.1

2. Place the doors face down on a padded work surface. Be especially careful with enameled doors.
3. Remove the screws that hold the glass retainer clips in place, and remove the clips.
4. Carefully lift the broken glass panel from the door.

Installing the Glass
Check the gasket around the window; it should be soft and resilient so that the glass will seal properly against the door. Replace the gasket if it has hardened or if it is compressed.

1. Center the glass on the gasket.
2. Secure the glass on both doors with the retainer clips. Tighten all screws, Figure 3.2.
3. Replace the doors on the stove.
4. Open and close the doors to check that they fit and work properly. Adjust as necessary.

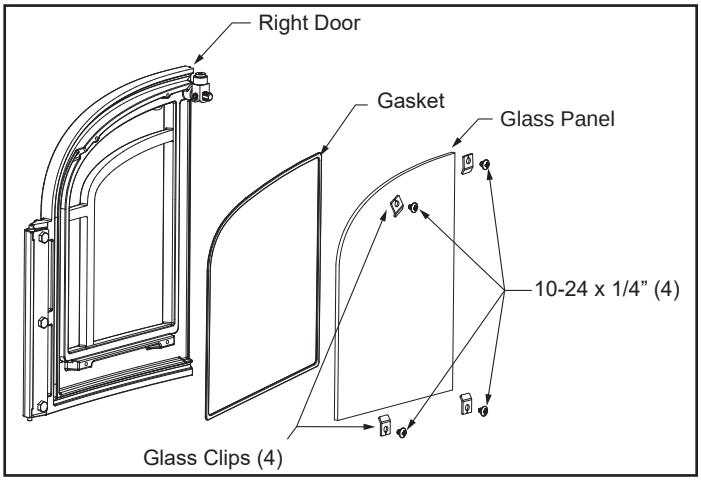


Figure 3.2 - Exploded view of the glass assembly for the right door.

B. Damper Adjustment (as Needed)

The tension on the Dauntless FlexBurn's damper is adjustable to compensate for compression of the gasket that seals the damper to the upper fireback. To adjust the damper:

1. Remove the griddle. Loosen the lock nut at the center of the damper, Figure 3.3.
2. Turn the pressure screw approximately one half turn clockwise with an Allen wrench provided with your stove.
3. Tighten the lock nut. Prevent the pressure screw from turning as you tighten the nut. Re-test the damper.

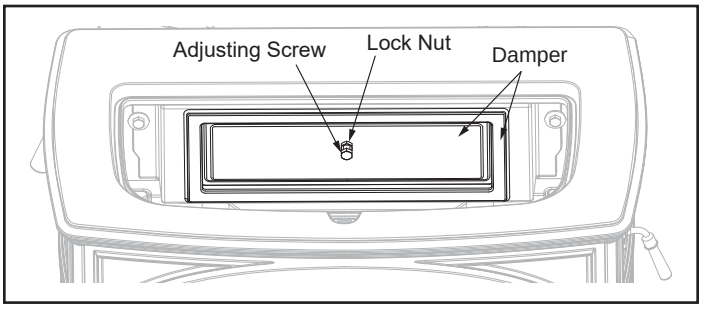


Figure 3.3 - Adjust the damper with the Allen wrench.

Tighten the Damper Handle as Needed

A handle on the left side of the stove controls the damper. The handle attaches to the damper rod with a set screw. Periodically check the set screw and tighten as necessary.

C. Door Latch Adjustment

The front door of the stove should close securely to prevent accidental opening and should close tightly to prevent air from leaking into the fire chamber. The door handle will be positioned vertically when the door is closed.

Over a period of time, the gasket around the door will compress and the latch may need adjustment. To adjust the handle, follow this procedure:

1. Remove and retain the lock nut with a 9/16" wrench, Figure 3.4.
2. Loosen the set screw with a 1/8" Allen wrench.
3. Rotate the pawl 180°. Replace the lock nut. Tighten the set screw, Figure 3.4.
4. Additional adjustment can be made by removing the flat washer. Or any combination of washer removal and/or pawl rotation.

Test the door seal. Close the door on a dollar bill and attempt to pull it free. If the bill is freed with little resistance, the gasket isn't snug enough at that spot. Continue to make small adjustments until the setting is right.

If additional adjusting of the latch does not enable the door to seal sufficiently in one area, try adjusting the gasket in that area. Pack more cement or a smaller diameter gasket into the channel beneath the gasket so the main gasket is raised and makes contact with the door frame. If this procedure doesn't solve the problem, replace the gasket. Instructions for gasket replacement are given later in this section.

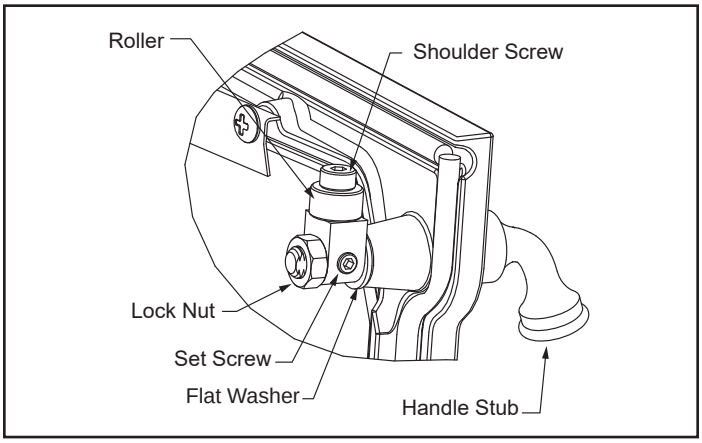


Figure 3.4 - Rotate pawl and/or remove flat washer to adjust latch.

D. Gasket Replacement (as needed)

Your Dauntless FlexBurn® uses fiberglass rope gaskets to make a tight seal between some parts. With use, particularly on moving parts, gaskets can become brittle and compressed and can begin to lose their effectiveness. These will need periodic replacement.

The sizes of replaceable gasket are listed below, along with their applications.

Gasket Diameter.....And the Parts it Seals

5/16" The griddle to the stove top (wire reinforced gasket)

3/8" The damper to the upper fireback

5/16" The front doors to the stove front; and the doors to each other.

5/16" The ash door to the front of the bottom panel

3/16" The outer glass panes to the door

If you need to change a gasket, first obtain an appropriate replacement from your Vermont Castings' Authorized Dealer.

Wait until the fire is out and the stove has cooled. Be sure to follow the standard safety procedure for working with dusty materials: wear safety goggles and a dust mask.

The procedure for replacing gaskets is the same, regardless of the gasket location. Follow these steps:

1. Remove the existing gasket by grasping an end and pulling firmly, Figure 3.5.

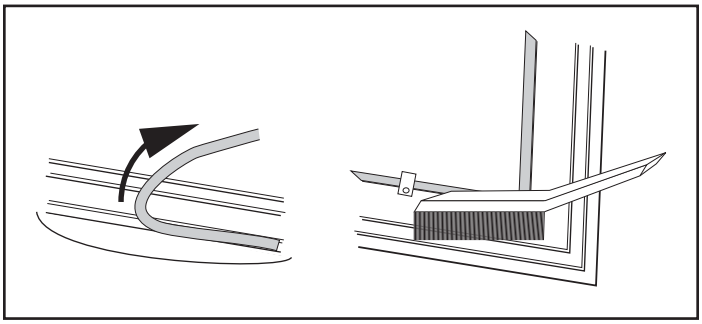


Figure 3.5 - Remove gasket then clean channel with wire brush.

2. Use a wire brush or the tip of a screwdriver to clean the channel of any remaining cement or bits of gasket. Remove stubborn deposits of cement with a cold chisel if necessary, Figure 3.5.
3. Determine the correct length of the appropriate-sized gasket by laying it out in the channel. Allow an extra 1-2" (25-50 mm), and mark the spot to be cut.
4. Remove the gasket from the channel, place it on a wood cutting surface, and cut it at the marked spot with a utility knife.

Twist the ends slightly to keep the gasket from unraveling.

5. Lay an unbroken 1/8" (3 mm) bead of silicone or cement in the newly-cleaned channel, Figure 3.6.

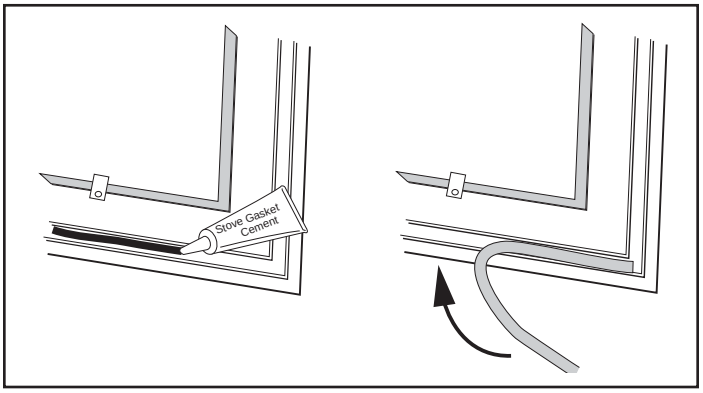


Figure 3.6 - Lay a bead of gasket silicone or cement then press gasket in place.

6. Starting at one end, press the gasket into the channel, Figure 3.6. Ensure a good joint where the gasket meets before trimming any excess. Do not overlap the gasket ends or leave ends with ragged edges.
7. Press the gasketed part firmly against its normal mating surface to seat the gasket evenly in its channel. Close and latch the door to do this, or tap other parts with the rubber mallet (or hammer/block of wood).
8. Clean any excess cement from around the channel, then let the cement that holds the new gasket dry thoroughly.
9. The stove's doors may need adjustment after you have regasketed them. Initially, it may require loosening the latch to accommodate the new gasket; after a few weeks, it may need tightening to compensate for compression of the new gasket.

All Gasketed Construction Gaskets

Other gaskets form seals between all other non-moving parts, but these are not subject to the same wear and deterioration as gaskets on moving parts. It is unlikely that you will ever need to replace these gaskets unless the involved parts are disassembled and then put back together. If this is the case, the job should be done only by a qualified service technician.

5/16" diameter gasket seals the following parts:

- The lower fireback to the back panel
- The left and right air plates (inner sides)
- All connections between the stove plates.

E. The Chimney System

Creosote

Your Dauntless FlexBurn® is designed to reduce creosote build-up significantly. However, regular chimney inspection and maintenance must still be performed. For safety, good stove performance, and to protect your chimney and chimney connector, inspect your chimney and chimney connector on a regular schedule. Clean the system if necessary. Failure to keep the chimney and connector system clean can result in a serious chimney fire.

⚠ WARNING

Inspect and Clean Chimney Frequently – Under certain conditions of use, creosote buildup may occur rapidly.

When wood is burned slowly, it produces tar, organic vapors and moisture that combine to form creosote. The creosote vapors condense in the relatively cool chimney flue of a slow-burning fire. As a result, creosote residue accumulates on the flue lining. When ignited, this creosote makes an extremely hot fire within the flue system that can damage the chimney and overheat adjacent combustible material. If a significant layer of creosote has accumulated —1/8" (3 mm) or more — it should be removed to reduce the risk of a chimney fire.

You can never be too safe. Contact your local fire authority for information on what to do in the event of a chimney fire, and have a clearly understood plan on how to handle one.

If you do experience a chimney fire, act promptly to:

- Close the damper and air control lever.
- Get everyone out of the house.
- Call the Fire Department.

Inspect the system every two weeks during the heating season as part of a regular maintenance schedule. To inspect the chimney, let the stove cool completely. Then, using a mirror and a strong light, sight up through the flue collar into the chimney flue. If you cannot inspect the flue system in this fashion, the stove must be disconnected to provide better viewing access.

Clean the chimney using a brush the same size and shape as the flue liner. Flexible fiberglass rods are used to run the brush up and down the liner, causing any deposits to fall to the bottom of the chimney where they can be removed through the clean-out door.

Clean the chimney connector by disconnecting the sections, taking them outside, and removing any deposits with a stiff wire brush. Reinstall the connector sections after cleaning, being sure to secure the joints between individual sections with sheet metal screws.

If you cannot inspect or clean the chimney yourself, contact your local Vermont Castings dealer or a professional chimney sweep.

Maintenance Schedule - The Stove

Daily:

- Clear any ash build-up from around the air holes and combustion flow path in the lower fireback.
- Ashes should be removed before they reach the top of the ash pan. Check accumulation at least once a day.
- Keep the area around the stove clear of any combustible materials such as wood, furniture or clothing.

Two Months:

- Check door handle to be sure it is working properly. Gasketing becomes compressed after a period of time. Adjust handle tightness if necessary.
- Check leg bolts and heat shield screws; tighten if necessary.
- **If installed:** Inspect the combustor for fly ash accumulation and physical damage. Clean the combustor as needed.

Annual Spring Cleaning:

- Check gasketing for wear, and replace if necessary.
- Remove ashes from the ash pan and replace with a moisture absorbing material (such as kitty litter) to keep the interior of the stove dry.
- Clean the dust from the inner sides of bottom, rear or pipe heat shields if your stove is equipped with them. Clean surfaces are better heat reflectors than dirty surfaces.
- Touch up the black paint.
- Inspect for and remove ash build-up behind the combustion package. This should be done in conjunction with annual cleaning of the chimney connector. Inspect the passage behind the combustion package (a mirror will be helpful) and vacuum away ash using a flexible vacuum hose inserted in the passage, Figure 3.7.

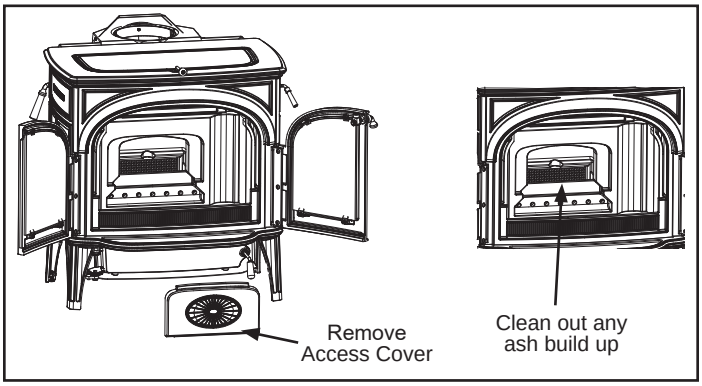


Figure 3.7 - Inspect and clean out ash accumulation behind the combustion system.

The Chimney Connector

Two Weeks

- Inspect the chimney connector and chimney. Clean if necessary.

Two Months:

- Inspect the chimney and chimney connector. Pay particular attention to the horizontal runs of chimney connector, and the elbows. Clean the system if necessary.

Annual Spring Cleaning:

- Disassemble the chimney connector and take it outdoors for inspection and cleaning. Replace weak sections of connector.
- Inspect the chimney for signs of deterioration. Repairs to a masonry chimney should be made by a professional mason. Replace damaged sections of prefabricated chimney. Your local Vermont Castings dealer or a chimney sweep can help determine when replacement is necessary.
- Thoroughly clean the chimney.

F. The Catalytic Element (Optional)

⚠ CAUTION

BURN UNTREATED WOOD ONLY. OTHER MATERIALS SUCH AS WOOD PRESERVATIVES, METALS, FOILS, COAL, PLASTIC, GARBAGE, SULPHUR, OR OIL, MAY DAMAGE THE CATALYST.

The Dauntless FlexBurn® is designed to burn equally well with or without a catalytic combustor (Part #30007430), however higher efficiencies will be achieved when operating with the catalyst. The following section only applies if the catalytic performance pack has been purchased and installed. The Dauntless FlexBurn® is designed and certified to function with or without a catalyst. In the event the combustor becomes non-functioning the combustor can either be replaced or removed completely.

If a non-active catalyst is left installed in the unit, it will burn sluggishly and produce noticeable smoke at the outlet of the venting system. The simplest situation in that case is to remove the deactivated catalyst and operate the unit as non-catalytic. The catalyst can then be replaced as time allows without producing a smoky burn or low heat output.

Under normal operating conditions, the catalytic combustor should remain active for five to seven years (depending on the amount of wood burned). However, it is important to monitor the combustor periodically to ensure that it is functioning properly, as well as to determine when it needs to be replaced.

When to Suspect a Combustor Problem

The best way to evaluate the performance of your Dauntless FlexBurn's combustor is to observe the amount of smoke leaving the chimney — both when the combustor has "lighted-off" and when it has not. Follow these steps:

- With a fire going and the combustor properly activated and the damper closed to route smoke through it as described in the Operation Section, go outside and observe the smoke leaving the chimney.
- Then, open the stove damper and once again check the smoke leaving the chimney.

You should see significantly more smoke when the stove damper is open and exhaust does not pass through the combustor. However, be careful not to confuse smoke with steam from wet wood. Steam dissipates in the air quickly; smoke does not. Remember that a hot stove with a 2"-3" established coal bed is required for catalytic combustion to occur.

If this test indicates a problem, consider other possible factors as well, such as the weather or a change in the quality of your fuel. In warm weather, draft is weaker than it is in colder winter weather, and fires can burn sluggishly. Small, hot fires are a good solution under these conditions.

NOTE

Burning "green" (insufficiently seasoned) wood will result in poorer performance than burning properly seasoned fuel. Reloading with green wood can also thermal shock the catalyst, resulting in cracking, or the eventual fallout, of the metal honeycomb substrate. You may have to run your stove hotter (more air) to achieve acceptable performance using green or wet wood.

Also, consider any changes in your operating routine.

Once you have ruled out any other possible causes for a decline in performance, inspect and clean the combustor if necessary. Be sure to protect any surface you use for setting the stove parts aside.

Inspecting the Combustor

Remove access door and inner firebrick. Remove the catalytic combustor by lifting up and pulling towards you, Figure 3.8.

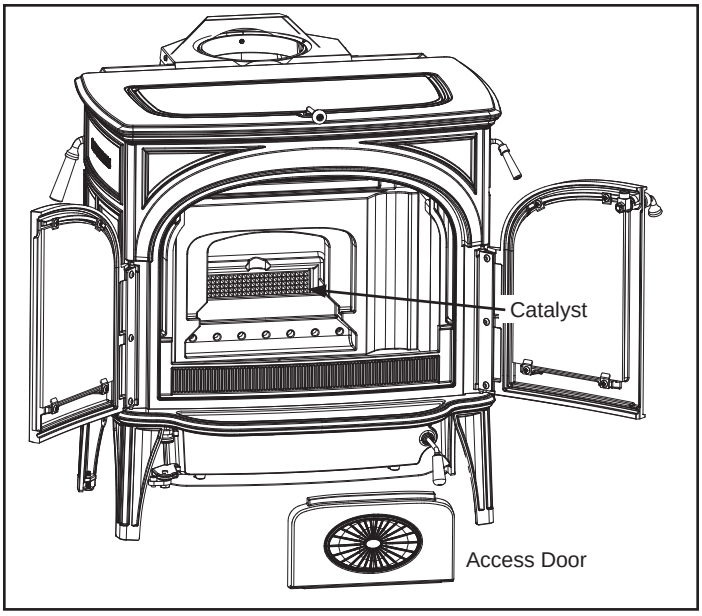


Figure 3.8 - Inspect the catalytic combustor.

Cleaning the Optional Combustor

1. Check the combustors honeycomb-like catalyst for a buildup of fly ash. If any is evident, take the catalyst outside and clean it by blowing air gently through it. Do not push anything through the honeycomb; the combustor should be cleaned by forcing air through the combustor to remove fly ash using a vacuum or can of compressed air.
2. Inspect the catalyst for damage or degradation. Although small hairline cracks will not affect performance, the catalyst should be essentially intact. If the catalyst is broken in pieces or has sections missing, it should be removed or replaced. Call your local Vermont Castings Authorized Dealer for a replacement catalyst.
3. If the catalyst is in good condition and clean, re-install it in the stove and replace the refractory access door.

4 Troubleshooting Guide

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

Start Fire Problems	Possible Cause	Solution
• Can not get fire started • Excessive smoke spillage • Burns too slowly • Not enough heat output	Not enough kindling/paper or no kindling/paper	Use dry kindling, more paper. Arrange kindling & wood for air movement.
	Not enough air for fire to ignite	Check for restricted termination cap
		Check for blockage of outside air kit (if installed).
		Check for flue blockage.
		Pre-warm flue before starting fire (refer to Building a Fire Section).
		Check for adequate vent height (refer to Chimney Height Section).
		Refer to Negative Pressure section
	Wood condition is too wet, too large	Use dry, seasoned wood (refer to Seasoned Wood Section).
	Bed of coals not established before adding wood	Start with paper & kindling to establish bed of coals (refer to Building a Fire Section).
	Flue blockage such as birds' nests or leaves in termination cap	Have chimney inspected for creosote and cleaned by a certified chimney sweep.
	Down draft or negative pressure Competition with exhaust devices	Do not use exhaust fans during start-up (refer to Negative Pressure Section).
Fire burns too fast	Extremely dry or soft wood	Mix in hardwood.
		Mix in larger pieces of wood after fire is established.
	Overdrafting	Check for correct vent height; too much vertical height creates overdrafting.
		Check location of vent termination (refer to Chimney Termination Requirement Section).
Low Heat Output	Coal Bed too small	Open damper. Establish deeper coal bed and move coals to the rear of the firebox.
Excessive Coal Bed	Operating on high for extended periods	Reduce burn rate and allow coals to burn down before reloading.

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

5 Reference Materials

A. Service & Maintenance Log

Date of Service	Performed By	Description of Service

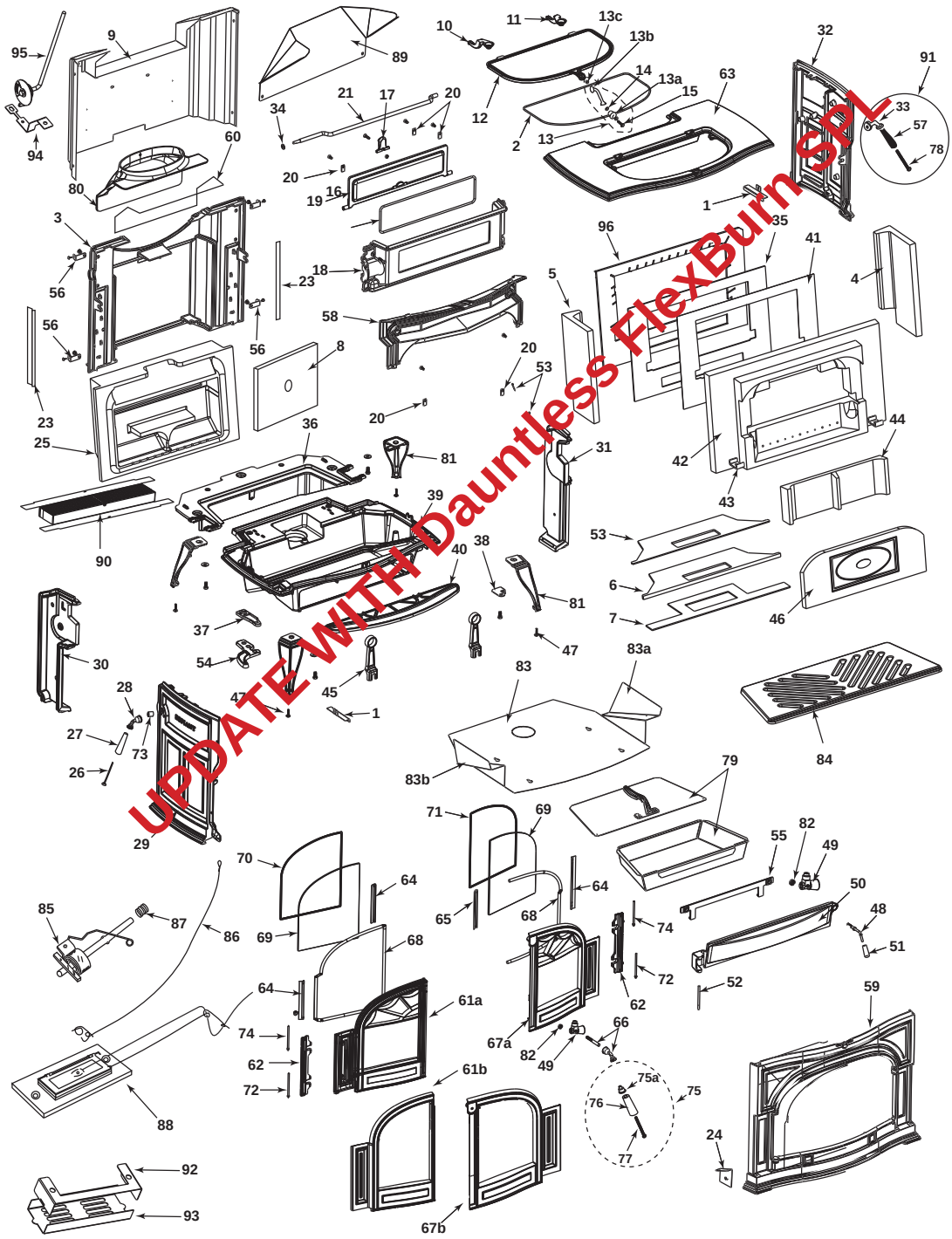
B. Service Parts & Accessories

VERMONT CASTINGS™ **Service Parts**

Defiant CAT-C

Beginning Manufacturing Date: Oct 2019
Ending Manufacturing Date: Active

1975-CAT-C (Classic Black)
1976-CAT-C (Biscuit)
1977-CAT-C (Majolica Brown)
1979-CAT-C (Bordeaux)
1980-CAT-C (Twilight)
1975T-CAT-C (Classic Black w/Transition Doors)



Part number list on following page.

06/19

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

ITEM	DESCRIPTION	COMMENTS	PART NUMBER	Stocked at Depot
1	Brick Support Bracket		30005279	
2	Griddle Gasket	10 Ft	1-00-1203668	**Y**
3	Back		30005242A	
4	Refractory, Right End		30005206	
5	Refractory, Left End		30005207	
6	Refractory Support		30005233	
7	Gasket, Cast Base		SRV8344-000	
8	Back Insulation Board		30005269	
9	Outer Back		30005249	
10	Griddle Quadrant, Left		30002399A	
11	Griddle Quadrant, Right		30002401A	
12	Griddle		30005257A	
13	Complete Griddle Handle Assembly		30002775	**Y**
13a	Griddle Handle, Wood		1600661	**Y**
13b	Griddle Handle, CRS-BN1		30002715	
13c	Nut, Hex 1/4-20	Pkg of 10	1203210-10	
14	Griddle Handle Bushing	Pkg of 10	1201900-10	
15	Griddle Handle Bolt	Pkg of 10	1201308-10	
16	Damper Gasket	15 Ft	1-00-1203588	**Y**
17	Damper Ramp		1300643	
18	Damper Housing		30002821A	
19	Damper		30002816	
20	Damper Tab	Pkg of 10	1601488-10	
21	Damper Rod		1600065	
23	Gasket, Back Refractory	10 Ft	1-00-30005270	
24	Rheostat Bracket		30002863	
25	Refractory, Engine - E/D		30005202	
26	Damper Handle Screw	Pkg of 10	1201310-10	
27	Damper Handle		1600664	**Y**
28	Damper Handle w/Screw Assembly		30002720A	**Y**
29	Left Side	Classic Black	30002832A	
		Biscuit	SRV30002872	
		Bordeaux	SRV30006697	
		Majolica Brown	SRV30004834	
		Twilight	SRV30007126	
30	Left Air Manifold		30002818	
31	Right Air Manifold		30005243	

Additional service part numbers appear on following page.

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

ITEM	DESCRIPTION	COMMENTS	PART NUMBER	Stocked at Depot
32	Right Side	Classic Black	30002831A	
		Biscuit	SRV30002871	
		Bordeaux	SRV30006698	
		Majolica Brown	SRV30004835	
		Twilight	SRV30007127	
33	Thermostat Handle Base		30002716	**Y**
34	Washer Damper Rod	Pkg of 10	30007257-10	
35	Refractory Gasket Plate, S/S		SRV8000-008	
36	Inner Bottom		30005241	
37	Top Ashdoor Hinge		1-00-30002836	
38	Door Handle Bracket		30002844	
39	Bottom		30005240A	
40	Ashlip	Classic Black	30002811A	
		Biscuit	SRV30002870	
		Bordeaux	SRV30006696	
		Majolica Brown	SRV30004833	
		Twilight	SRV30007125	
41	Gasket, Fireback		30005209	
42	Refractory, Fireback		30005203	
43	Retainer, Fireback Refractory		30005248	
44	Refractory, Inner Cover		30005205	**Y**
45	Andiron		30002827A	**Y**
46	Refractory, Access Cover		30007252	
47	Leg Leveler	Pkg of 10	1201745-10	
48	Ashdoor Handle Shaft		30005301	
49	Pawl Assembly, 3/4 Short Adj.		30005157	**Y**
49a	Spring Washer	Pkg of 10	63D0069-10	
50	Ashdoor		30002810A	
50a	Ashdoor Gasket	15 Ft	1-00-1203589	
51	Ashdoor Handle, Wood		1600663	**Y**
52	Hinge Hardware		1-00-2826	
53	Gasket, Ceramic Fiber		SRV30007513	
54	Ashdoor Bottom Hinge Support		1-00-1300642	
55	Ashpan Bracket		30001908	
56	Rear Side Bracket		30002845	
57	Thermostat Handle		1600660	**Y**
58	Airwash Manifold, Front		30005244	

Additional service part numbers appear on following page.

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

ITEM	DESCRIPTION	COMMENTS	PART NUMBER	Stocked at Depot
59	Front	Classic Black	30002830A	
		Biscuit	SRV30002873	
		Bordeaux	SRV30006699	
		Majolica Brown	SRV30004836	
		Twilight	SRV30007128	
60	Flue Collar Gasket		1-00-30002422	
61a	Left Door (Shell Enamel Parts)	Classic Black	30002813A	
		Biscuit	SRV30002876	
		Bordeaux	SRV30006703	
		Majolica Brown	SRV30004842	
		Twilight	SRV30007132	
	Left Door Sub Assembly (Shell Enamel Parts) (Does not contain glass or glass gasket)	Classic Black	30002854	
		Biscuit	30002879	
		Bordeaux	30006773	
		Majolica Brown	30004840	
		Twilight	30007133	
61b	Left Door (Transition Door Enamel)	Classic Black	30007091A	
		Biscuit	SRV30007093	
		Bordeaux	SRV30007097	
		Majolica Brown	SRV30007095	
		Twilight	SRV30007109	
	Left Door Sub Assembly (Transition Door Enamel)	Classic Black	30007175	
		Biscuit	30007177	
		Bordeaux	30007179	
		Majolica Brown	30007181	
		Twilight	30007183	
62	Door Hinge Strip		1300645A	
63	Top	Classic Black	30002834A	
		Biscuit	SRV30002874	
		Bordeaux	SRV30006700	
		Majolica Brown	SRV30004837	
		Twilight	SRV30007129	
64	Glass Clip		30001715	
65	Glass Clip (Right Door Only)		30001716	
66	Front Door Handle and Shaft		30002717	Y

Additional service part numbers appear on following page.

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

ITEM	DESCRIPTION	COMMENTS	PART NUMBER	Stocked at Depot
67a	Right Door (Shell Enamel Parts)	Classic Black	30002812A	
		Biscuit	SRV30002875	
		Bordeaux	SRV30006702	
		Majolica Brown	SRV30004841	
		Twilight	SRV30007131	
	Right Door Sub Assembly (Shell Enamel Parts) (Does not contain glass or glass gasket)	Classic Black	30002853	
		Biscuit	30002878	
		Bordeaux	30006772	
		Majolica Brown	30004839	
		Twilight	30007134	
67b	Right Door (Transition Door Enamel)	Classic Black	30007090A	
		Biscuit	SRV30007092	
		Bordeaux	SRV30007096	
		Majolica Brown	SRV30007094	
		Twilight	SRV30007108	
	Right Door Sub Assembly (Transition Door Enamel)	Classic Black	30007176	
		Biscuit	30007178	
		Bordeaux	30007180	
		Majolica Brown	30007182	
		Twilight	30007184	
68	Door Gasket	15 Ft	1-00-7000910	**Y**
69	Glass Gasket	10 Ft	1-00-1186258229	**Y**
70	Left Door Glass		30005247	
71	Right Door Glass		30005247	
72	Lower Door Hinge Pin		30002727	**Y**
73	Spacer (For Damper Rod)	Pkg of 10	1201779-10	
74	Upper Door Hinge Pin		30002727	**Y**
75	Complete Handle Assembly		30004175K	**Y**
75a	Handle Base Stub		30002714	**Y**
76	Wood Handle		1600664	**Y**
77	Handle Bolt	Pkg of 10	1201310-10	
78	Thermostat Handle Botl	Pkg of 10	1201243-10	
79	Ash Pan Assembly		30001690	
80	Flue Collar	Classic Black	30001576A	
		Biscuit	SRV30002947	
		Bordeaux	SRV30006701	
		Majolica Brown	SRV30004815	
		Twilight	SRV30007130	

Additional service part numbers appear on following page.

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

ITEM	DESCRIPTION	COMMENTS	PART NUMBER	Stocked at Depot
81	Leg	Classic Black	30002835A	
		Biscuit	SRV30002877	
		Bordeaux	30006695A	
		Majolica Brown	30004843A	
		Twilight	30007124	
82	Jam Nut, Hex Head	Pkg of 10	1203290-10	
83	Bottom Heat Shield		30005037	
83a	Bottom Heat Shield, Right Wing		30005038	
83b	Bottom Heat Shield, Left Wing		30005039	
84	Grate Bottom		30005234A	
85	Thermostat Assembly		5005470	Y
86	Thermostat Cable		5005471	Y
87	Thermostat Friction Spring	Pkg of 10	1201846-10	
88	Primary Air Valve Assembly		30005275	
89	Heat Plate Vertical Flue		30005265	
90	Catalyst, Ceramic		30006623	
91	Thermostat Handle Assembly		30007067	
92	Primary Air Cover		30007069	
93	Primary Air Base		30007071	
94	Temperature Probe		30007274	
95	Braket, Temperature Probe		30007278	
96	Gasket, Slotted Refractory		SRV8344-001	
	Finish Bag		SRV8000-007	
	Warming Shelf Kit	Classic Black	0000210	
		Biscuit	0000211	
		Bordeaux	0000218	
		Majolica Brown	0000217	
		Twilight	0000219	
	Shelf	Classic Black	30002823A	
		Biscuit	SRV30002900	
		Bordeaux	SRV30006704	
		Majolica Brown	SRV30004844	
		Twilight	SRV30007135	
	Dragon Bracket	Classic Black	1302220A	
		Biscuit	SRV30002948	
		Bordeaux	30006690A	
		Majolica Brown	SRV30004818	
		Twilight	SRV30007075	
	Bracket, Left		30002478A	
	Bracket, Right		30002479A	

C. Contact Information

VERMONT CASTINGS

CONTACT INFORMATION

Hearth & Home Technologies
352 Mountain House Road
Halifax, PA 17032

Please contact your Vermont Castings dealer with any questions or concerns.

For the number of your nearest Vermont Castings dealer log onto www.vermontcastings.com

CAUTION

DO NOT DISCARD THIS MANUAL

- Important operating and maintenance instructions included.
- Read, understand and follow these instructions for safe installation and operation.
- Leave this manual with party responsible for use and operation.

We recommend that you record the following pertinent information for your heating appliance.

Date purchased/installed: _____

Serial Number: _____ Location on appliance: _____

Dealership purchased from: _____ Dealer phone: _____

Notes: _____

_____

_____

_____

This product may be covered by one or more of the following patents: (United States) 5341794, 5263471, 6688302, 7216645, 7047962 or other U.S. and foreign patents pending.

HEARTH & HOME technologies®

Installation Manual

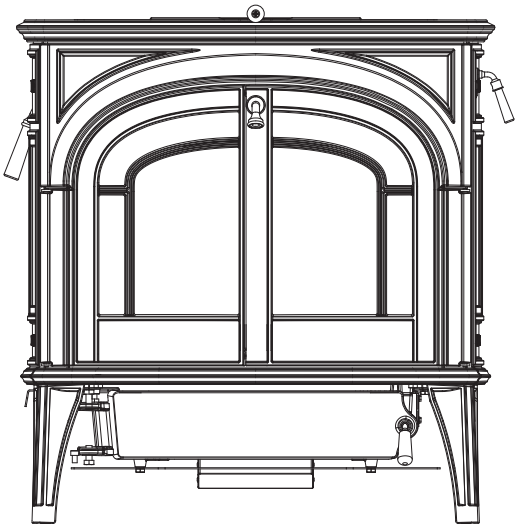
Installation & Appliance Set-Up

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

NOTICE: DO NOT DISCARD THIS MANUAL

VERMONT CASTINGS

Dauntless FlexBurn® Wood Stove



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

hearthED FACTORY TRAINING Fuel Your Fire

NFI NATIONAL FIREPLACE INSTITUTE A CERTIFICATION AGENCY

⚠ WARNING

If the information in these instructions is not followed exactly, a fire may result causing property damage, personal injury, or death.

- Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.
- Do not over fire - If appliance or chimney connector glows, you are over firing. Over firing will void your warranty.
- Comply with all minimum clearances to combustibles as specified. Failure to comply may cause house fire.

⚠ WARNING

HOT SURFACES!
Glass and other surfaces are hot during operation AND cool down.
Hot glass will cause burns.

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

NOTE

To obtain a French translation of this manual, please contact your dealer or visit www.vermontcastings.com

Pour obtenir une traduction française de ce manuel, s'il vous plaît contacter votre revendeur ou visitez www.vermontcastings.com

⚠ Safety Alert Key:

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

TABLE OF CONTENTS

➔ **= Contains updated information**

1 Product Listing and Important Safety Information

A. Appliance Certification

MODEL:	Dauntless FlexBurn® Wood Stove
LABORATORY:	OMNI Test Laboratories, Inc
REPORT NO.	0061WS104E, 0061WS104S
TYPE:	Solid Fuel Type Room Heaters
STANDARD(s):	ASTM E2515, ASTM E3053, UL-1482, ULC-S627, B415.1

B. BTU & Efficiency Specifications

EPA Report #:	(without catalyst) (catalytic)
EPA Certified Emissions:	1.1 g/hr (without catalyst) 1.2 g/hr (catalytic)
***LHV Tested Efficiency:**	81.6% (without catalyst) 82.6% (catalytic)
****HHV Tested Efficiency:**	76.9% (without catalyst) 77.9% (catalytic)
*****EPA BTU Output:**	12,250 - 49,430 (without catalyst)
	14,520 - 41,940 (catalytic)
******Peak BTU/Hour Output:**	54,100 (without catalyst) 48,300 (catalytic)
Vent Size:	6 Inch (152 mm)
Firebox Size:	1.8 cu. ft.
Recommended Length:	16”
Max. Wood Length:	18”
Fuel Orientation:	East, West
Fuel	Seasoned Cordwood (20% moisture)
*Weighted average LHV efficiency using Douglas Fir dimensional lumber and data collected during EPA emissions test.	
****Weighted average HHV efficiency using Douglas Fir dimensional lumber and data collected during EPA emissions test.	
*****Efficiencies are based on test results calculated using B415; these calculated efficiencies are then used to calculate output BTU’s.	
******A peak BTU out of the appliance calculated using the maximum first hour burn rate from the High EPA Test and the BTU content of cord wood (8600) times the efficiency.	

The Vermont Castings Dauntless FlexBurn® Wood Appliance meets the U.S. Environmental Protection Agency Certified to comply with the 2020 particulate emission standards using cord wood.

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

C. Mobile Home Approved (USA ONLY)

- This appliance is approved for mobile home installations in the USA when not installed in a sleeping room and when an outside combustion air inlet is provided.
- The structural integrity of the mobile home floor, ceiling, and walls must be maintained.
- The unit must be bolted to the floor. This can be done using an appropriate fastener for the application.
- The appliance must be properly grounded to the frame of the mobile home with #8 copper ground wire, and chimney must be listed to UL103 HT or a listed UL-1777 full length six” (152mm) diameter liner must be used.
- Mobile Home Bracket Kit #2-00-586189 must be installed in a mobile home installation.

D. Glass Specifications

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

⚠ WARNING

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

- Installation and use of any damaged appliance.
- Modification of the appliance.
- Installation other than as instructed by Hearth & Home Technologies.
- Installation and/or use of any component part not approved by Hearth & Home Technologies.
- Operating appliance without fully assembling all components.
- Operating appliance without legs attached (if supplied with it).
- Do NOT Over fire - If appliance or chimney connector glows, you are over firing.

Any such action that may cause a fire hazard.

NOTE: This installation must conform with local codes. In the absence of local codes you must comply with the UL1482-11, UL 737-11, (UM) 84-HUD and NPFA211 in the U.S.A. and the ULC S627-00 and CAN/CSA-B365 Installation Codes in Canada. **NOT APPROVED FOR MOBILE HOME INSTALLATIONS IN CANADA!**

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

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

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

Hearth & Home Technologies WILL NOT warranty appliances that exhibit evidence of over-firing. Evidence of over-firing includes, but is not limited to:

- Warped Damper
- Deteriorated refractory
- Deteriorated interior components

E. Non-Combustible Materials

Material which will not ignite and burn, composed of any combination of the following:

- Steel	- Plaster
- Brick	- Iron
- Concrete	- Tile
- Glass	- Slate

Materials reported as passing **ASTM E 136, Standard Test Method for Behavior of Metals, in a Vertical Tube Furnace of 750° C.**

F. Combustible Materials

Material made of/or surfaced with any of the following materials:

- Wood	- Compressed Paper
- Plant Fibers	- Plastic
- Plywood/OSB	- Sheet Rock (drywall)

Any material that can ignite and burn: flame proofed or not, plastered or non-plastered.

G. California

WARNING

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

2 Getting Started

A. Design and Installation Considerations

Consideration must be given to:

- Safety
- Convenience
- Traffic flow
- Chimney and chimney connector required

It is a good idea to plan your installation on paper, using exact measurements for clearances and floor protection, before actually beginning the installation. If you are not using an existing chimney, place the appliance where there will be a clear passage for a factory-built listed chimney through the ceiling and roof.

We recommend that a qualified building inspector and your insurance company representative review your plans before and after installation.

If this appliance is in an area where children may be near it is recommended that you purchase a decorative barrier to go in front of the appliance. Remember to always keep children away while it is operating and do not let anyone operate this appliance unless they are familiar with these operating instructions.

⚠ CAUTION

Check building codes prior to installation.

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

⚠ WARNING

Asphyxiation Risk

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

May allow flue gases to enter the house.

B. Fire Safety

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

1. Install at least one smoke detector on each floor of your home to ensure your safety. They should be located away from the heating appliance and close to the sleeping areas. Follow the smoke detector manufacturer's placement and installation instructions, and be sure to maintain regularly.
2. A conveniently located Class A fire extinguisher to contend with small fires resulting from burning embers.
3. A CO detector should be installed in the room with the appliance.
4. A practiced evacuation plan, consisting of at least two escape routes.
5. A plan to deal with a chimney fire as follows:
   In the event of a chimney fire:
   a. Evacuate the house immediately
   b. Notify fire department.

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

- Inadequate draft due to environmental conditions
- Down drafts
- Tight sealing construction of the structure
- Mechanical exhausting devices
- Over drafting caused by excessive chimney heights
- Ideal performance is with height of chimney between 16 feet (4.88m) measured from the base of the appliance.

C. Negative Pressure

⚠ WARNING

Asphyxiation Risk

- Negative pressure can cause spillage of combustion fumes, soot and carbon monoxide.
- Appliance needs to draft properly for safety.

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

Causes include:

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

To minimize the effects of negative air pressure:

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

⚠ WARNING

Fire Risk.

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

- Installation and use of any damaged appliance.
- Modification of the appliance.
- Installation other than as instructed by Hearth & Home Technologies.
- Installation and/or use of any component part not approved by Hearth & Home Technologies.
- Operating appliance without fully assembling all components.
- Operating appliance without legs attached (if supplied with appliance).
- Do NOT Over fire - If appliance or chimney connector glows, you are over firing.

Any such action that may cause a fire hazard.

D. Tools And Supplies Needed

Before beginning the installation be sure the following tools and building supplies are available:

- Reciprocating saw
- Pliers
- Hammer
- Phillips screwdriver
- Flat blade screwdriver
- Plumb line
- Level
- Misc. screws and nails
- 1/2-3/4 in. length, #6 or #8 self-drilling screws
- Framing material
- High temp caulking material
- Gloves
- Framing square
- Electric drill and bits
- Safety glasses
- Tape measure

E. Inspect Appliance and Components

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

⚠ WARNING

Fire Risk

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

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

Report damaged parts to dealer.

F. Install Checklist

ATTENTION INSTALLER:
Follow this Standard Work Checklist

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

Customer: _____

Date Installed: _____

Lot/Address: _____

Location of Appliance: _____

Installer: _____

Dealer/ Distributor Phone #: _____

Serial #: _____

Model : _____

WARNING! Risk of Fire or Explosion! *Failure to install appliance according to these instructions can lead to a fire or explosion.*

Appliance Install	**YES**	**IF NO, WHY?**
Verified clearance to combustibles.		
Appliance is leveled and connector is secured to appliance.		
Hearth extension size/height decided.		
Outside Air Kit Installed.		
Floor protection requirements have been met.		
If appliance is connected to a masonry chimney, it should be cleaned and inspected by a professional. If installed to a factory built metal chimney, the chimney must be installed according to the manufacturer's instructions and clearances.		
Chimney		
Chimney configuration complies with diagrams.		
Chimney installed, looked and secured in place with proper clearance.		
Chimney meets recommended height requirements (16 Feet).		
Roof flashing installed and sealed.		
Terminations installed and sealed.		
Clearances		
Combustible materials not installed on non-combustible areas.		
Verified all clearances meet installation manual requirements.		
Mantels and wall projections comply with installation manual requirements.		
Protective hearth strips and hearth extensions installed per manual requirements.		
Appliance Setup		
All packaging and protective materials removed.		
Firebrick, baffle and ceramic blanket installed correctly		
All labels have been removed from the door.		
All packaging materials are removed from inside/under the appliance.		
Manual bag and all of its contents are removed from inside/under the appliance and given to the party responsible for use and operation.		

Hearth & Home Technologies recommends the following:

- Photographing the installation and copying this checklist for your file.
- That this checklist remain visible at all times on the appliance until the installation is complete.

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

Comments communicated to party responsible _____ by _____ on _____

(Builder/Gen. Contractor) (Installer) (Date)

3 Dimensions and Clearances

A. Appliance Dimensions

NOTE: Flue Collar size is 6” (152mm) diameter (ID)

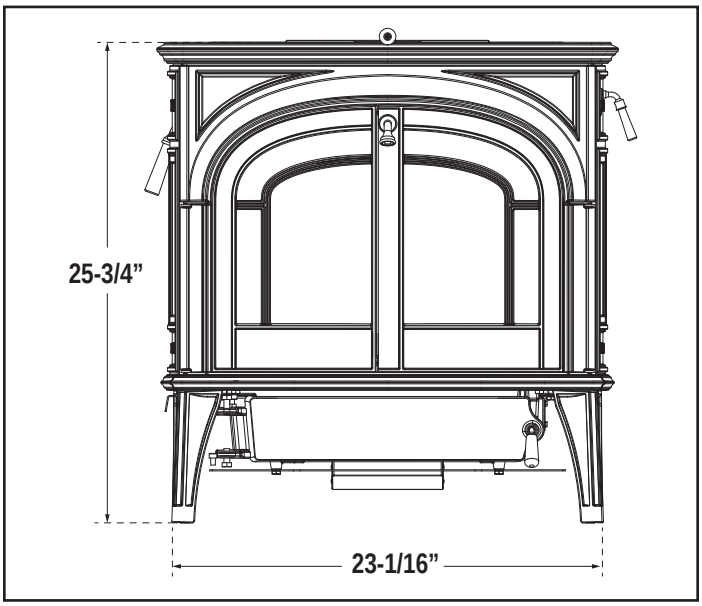


Figure 3.1 - Front View

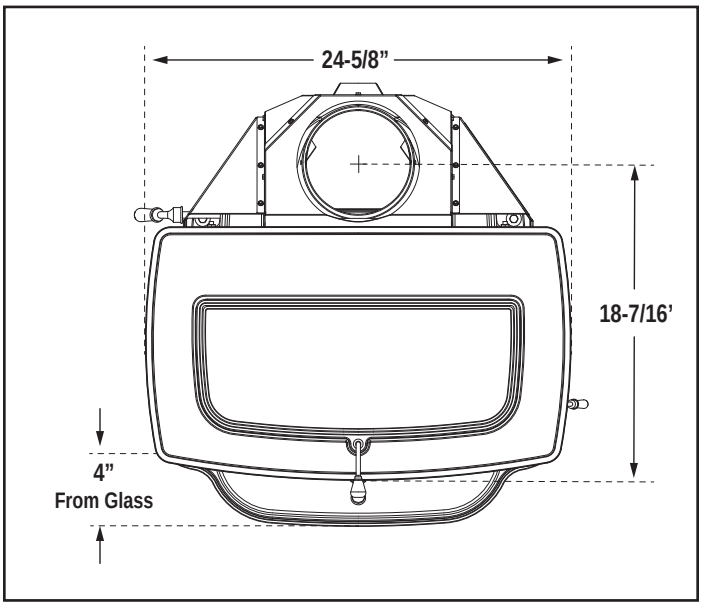


Figure 3.2 - Top View

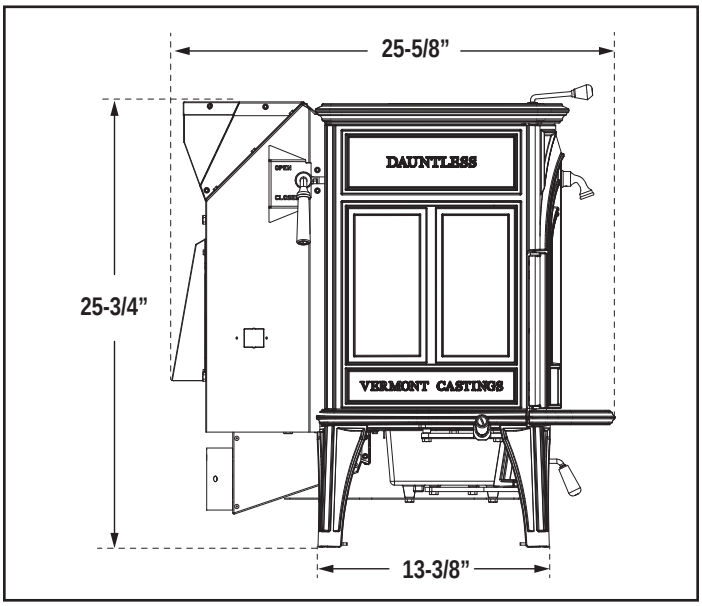


Figure 3.2 - Side View - Top Vent

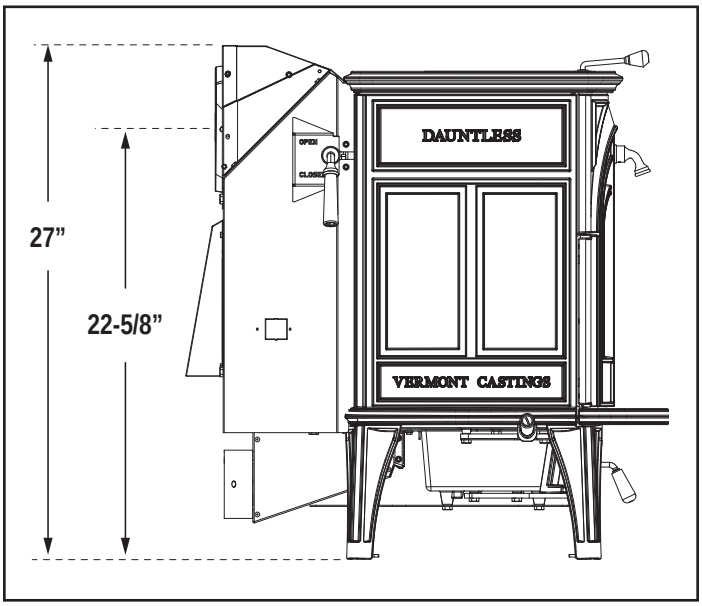


Figure 3.4 - Side View - Rear Vent

B. Hearth Protection Requirements

FLOOR PROTECTION: It is necessary to install a Type I floor protector. (Spark & Ember protection ONLY)

Floor protector must be non-combustible material extending under the appliance to a minimum of 16” (406 mm) in front of glass, and 8” (203 mm) to both sides of the fuel loading door. Open the door and measure 8” (203 mm) from the side edge of the opening in the face of the appliance. *See exception.

In Canada, similar floor protection must be provided 18” (457 mm) in front and 8” (203 mm) from the sides and rear of the appliance, Figure 3.8

***EXCEPTION:** Non-combustible floor protections must extend beneath the flue pipe when installed with horizontal venting and extend 2” (51 mm) beyond each side, Figure 3.7.

WARNING

Fire Risk

Hearth pads must be installed exactly as specified. High temperatures or hot embers may ignite concealed combustibles.

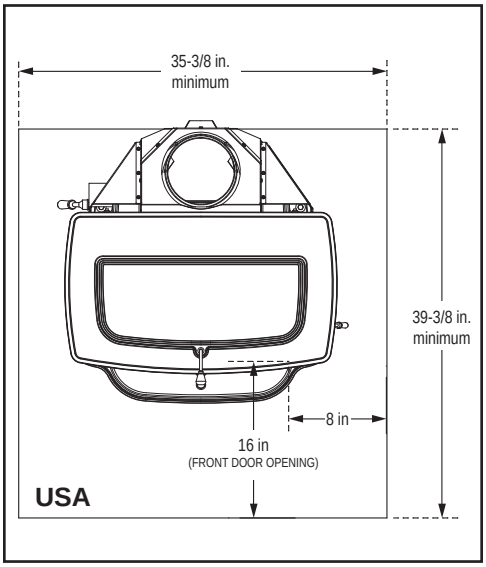


Figure 3.5

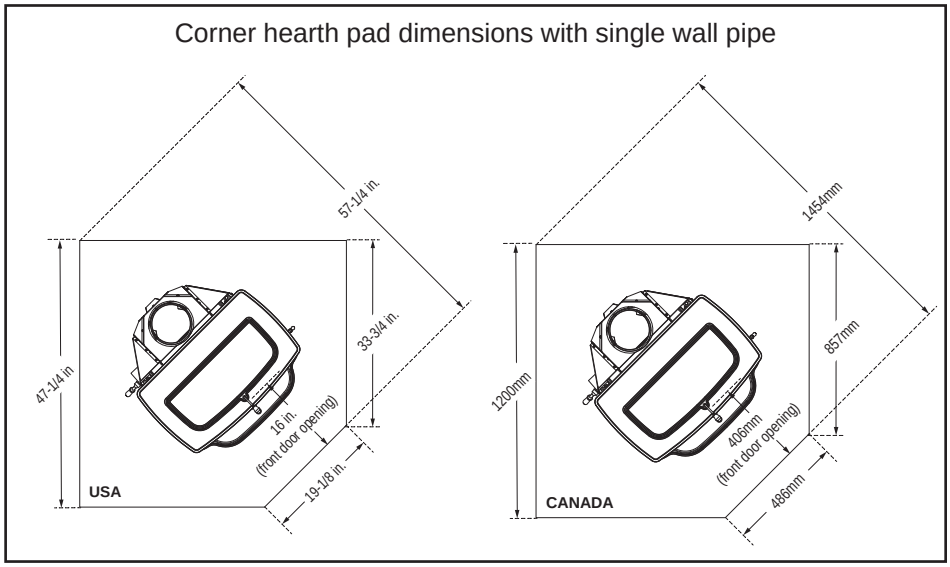


Figure 3.6

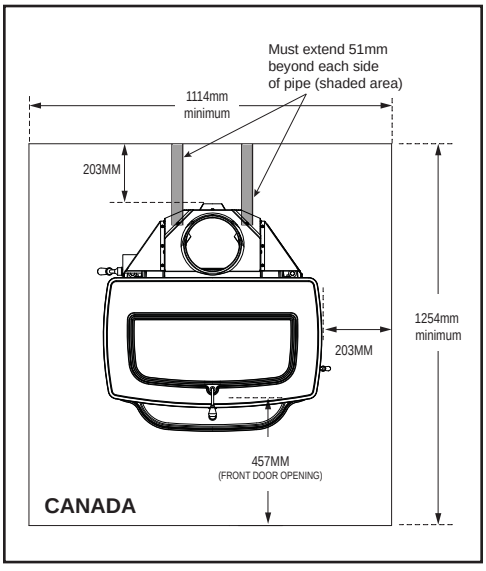


Figure 3.7

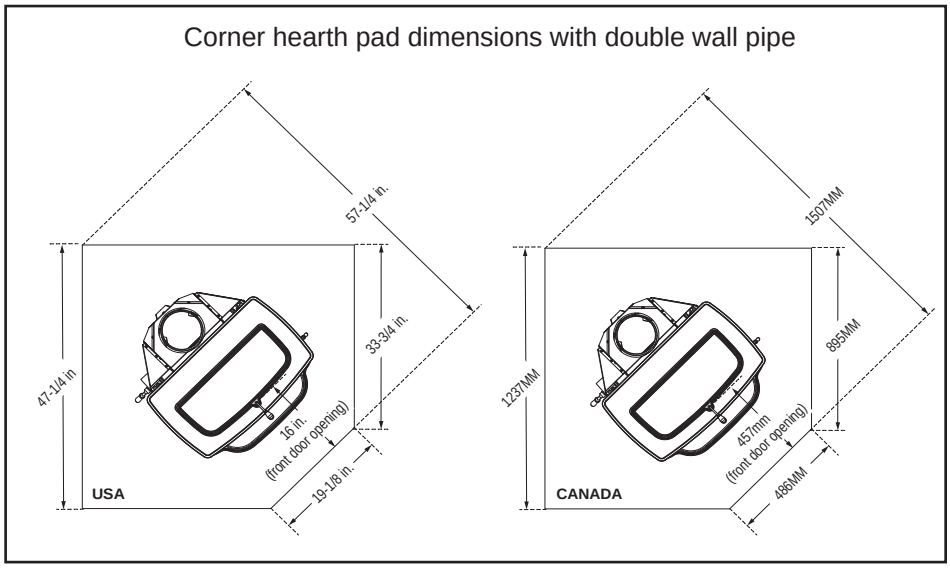


Figure 3.8

C. Clearances to Combustibles

Minimum Clearances to Combustible Materials Note: A, C and F Dimensions are to the center of the flue collar								
Installation: Full Vertical								
	A	**B**	**C**	**D**	**E**	**F**	**G**	**H***
Single Wall Pipe								
Double Wall Pipe								
Installation: 90 Degree Elbow off Top of Appliance through back wall								
Double Wall Pipe								
Installation: Horizontal Through the Wall								
Single Wall Pipe								

For Factory Alcove: 6” diameter listed Double wall air insulated connector pipe with UL103 HT listed factory built Class A Chimney or Masonry chimney. Maximum depth Alcove shall be no more than 48” (1219 mm) and the referenced Alcove clearances. Canada must comply with CAN/ULC-S269 M87 for the 650° factory built chimney.

*Follow pipe manufacturers clearances as required.

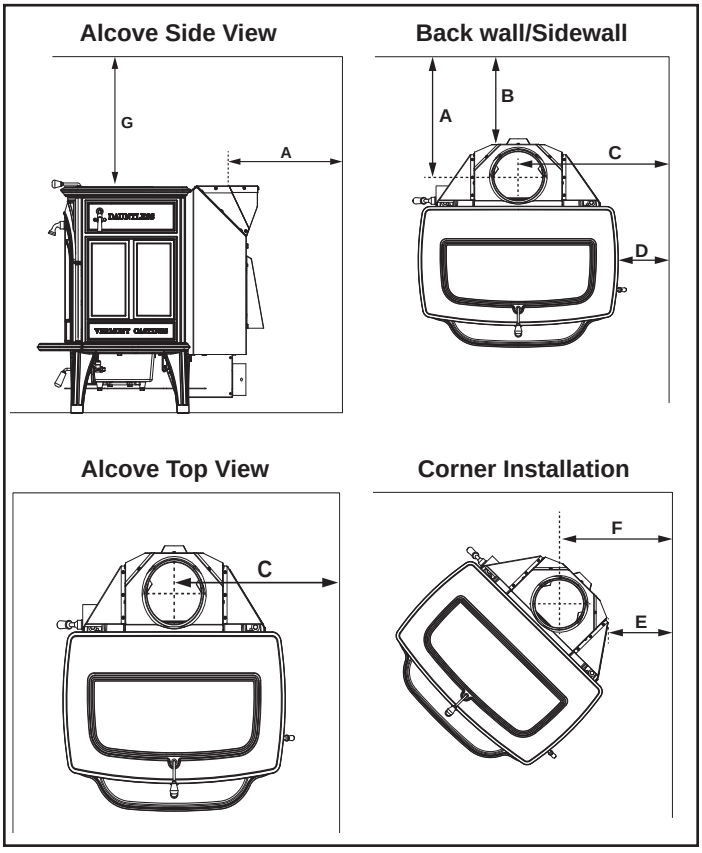


Figure 3.9

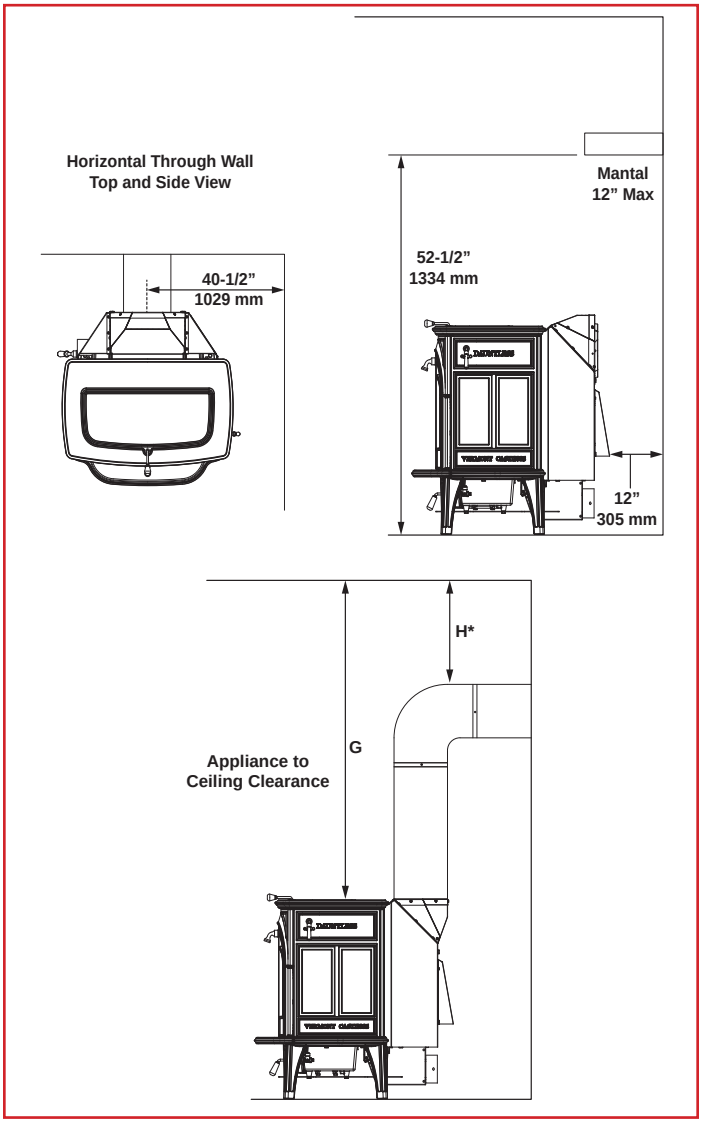


Figure 3.10

WARNING

Fire Risk

- Comply with all minimum clearances to combustibles as specified.
- Failure to comply may cause house fire.

D. Locating Your Appliance & Chimney

Location of the appliance and chimney will affect performance. As shown in Figure 3.11 the chimney should:

- Install through the warm space enclosed by the building envelope. This helps to produce more draft, especially during lighting and die down of the fire.
- Penetrate the highest part of the roof. This minimizes the affects of wind turbulence and down drafts.
- Consider the appliance location in order to avoid floor and ceiling attic joists and rafters.
- Locate termination cap away from trees, adjacent structures, uneven roof lines and other obstructions.

Your local dealer is the expert in your geographic area and can usually make suggestions or discover solutions that will easily correct your flue problem.

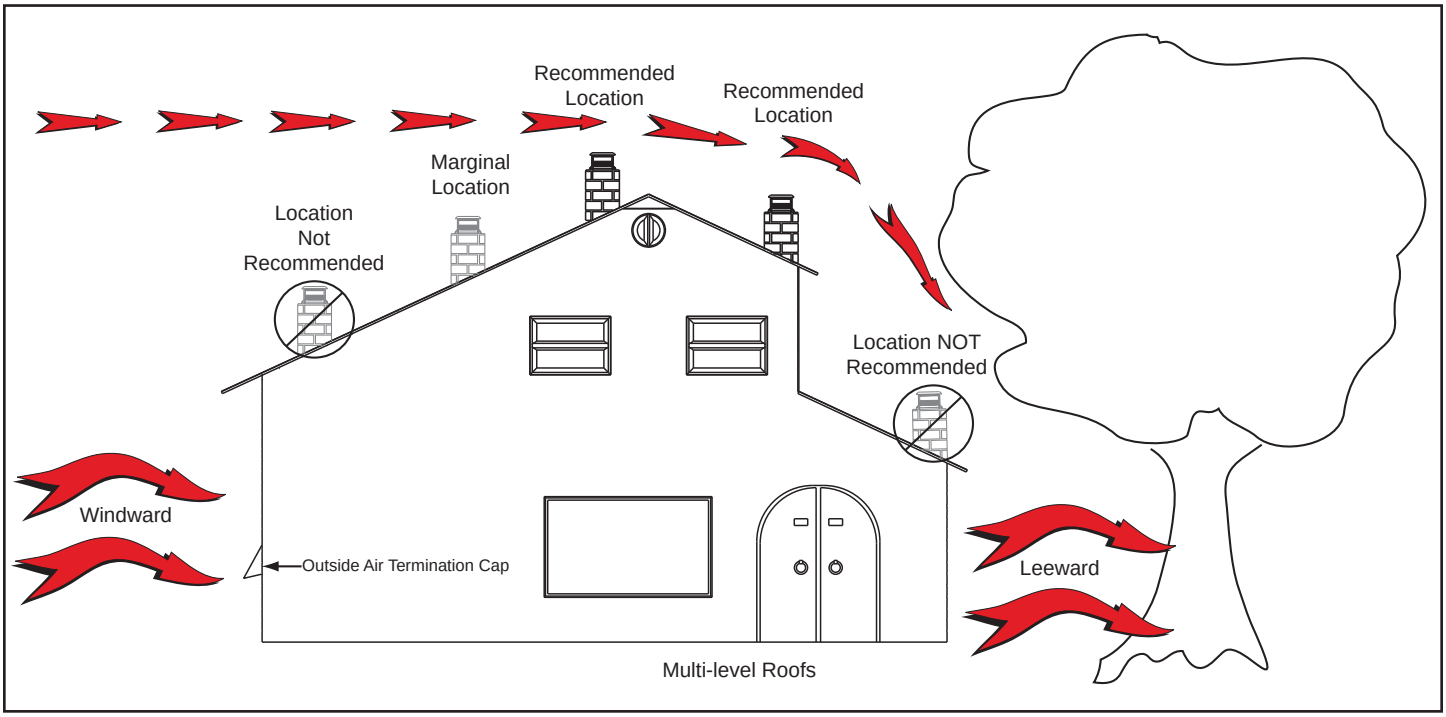


Figure 3.11

E. Chimney Termination Requirements

Follow manufacturer's instructions for clearance, securing flashing and terminating the chimney, Figures 3.12 & 3.13.

- Must have an approved and Listed cap
- Must not be located where it will become plugged by snow or other material
- Must terminate at least 3 feet (91 cm) above the roof and at least 2 feet (61 cm) above any portion of the roof within 10 feet (305 cm).
- Must be located away from trees or other structures

NOTICE:

- Chimney performance may vary.
- Trees, buildings, roof lines and wind conditions affect performance.
- Chimney height may need adjustment if smoking or overdraft occurs.

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

- Frequently open doors
- Central heat outlets or returns

F. Chimney Location (2-10-3 Rule)

These are safety requirements and are not meant to assure proper flue draft.

This appliance is made with a 6” (152 mm) diameter chimney connector as the flue collar on the appliance.

- Changing the diameter of the chimney can affect draft and cause poor performance.
- It is not recommended to use offsets and elbows at altitudes above 4000 feet above sea level and or when there are other factors that affect flue draft.

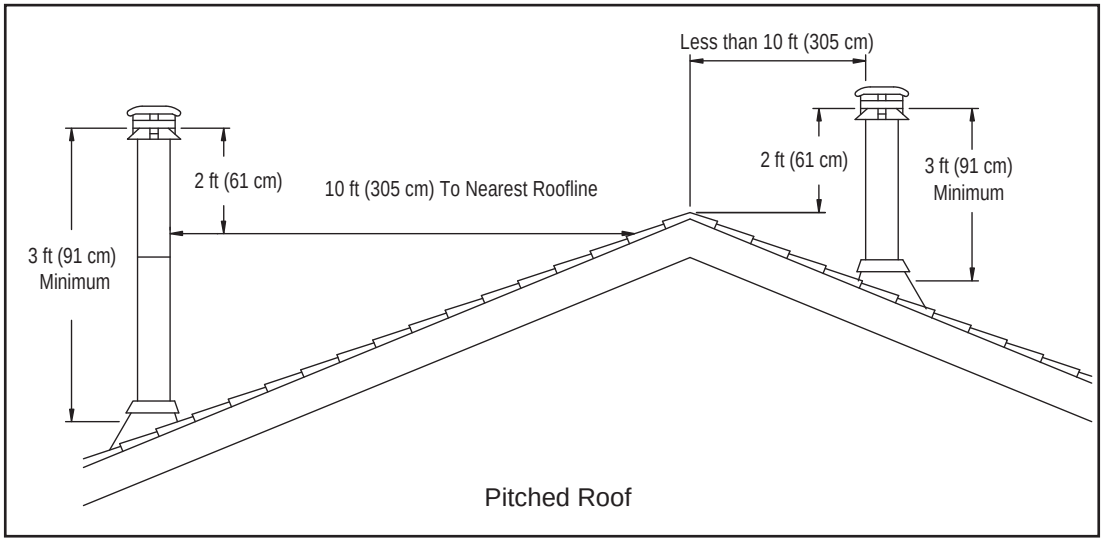


Figure 3.12

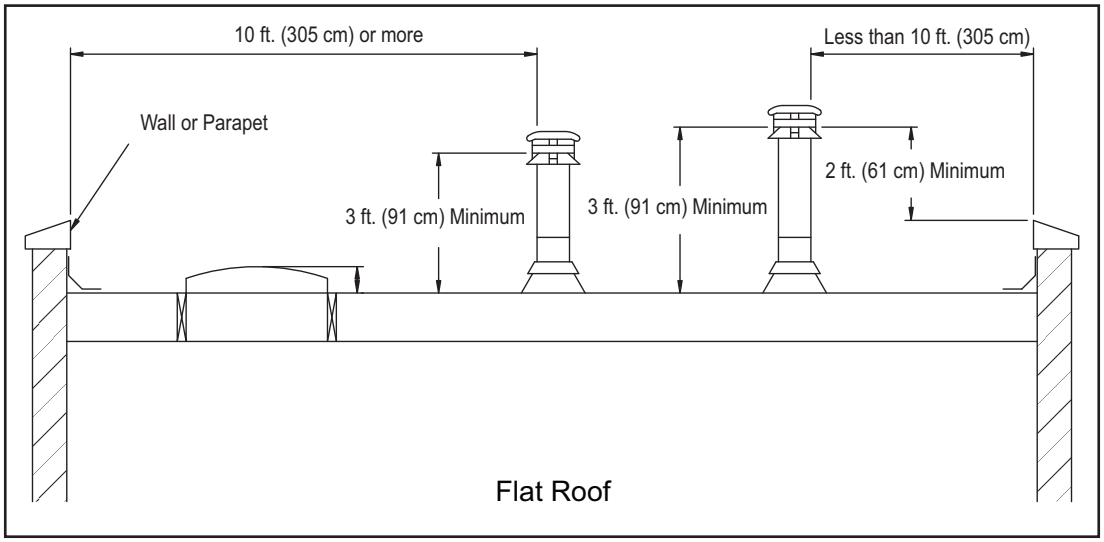


Figure 3.13

4 Chimneys & Venting

A. Venting & Draft Management

A stove is part of a system, which includes the chimney, the operator, the fuel, and the home. The other parts of the system will affect how well the stove works. When there is a good match between all the parts, the system works well.

Wood stove or insert operation depends on natural (unforced) draft. Natural draft occurs when the exhaust is hotter (and therefore lighter) than the outdoor air at the top of the chimney. The bigger the temperature difference, the stronger the draft. As the hot gases rise through the chimney they provide suction or 'draw' that pulls air into the stove for combustion. A slow, lazy fire with the stove's air inlets fully open indicates a weak draft. A brisk fire, supported only by air entering the stove through the normal inlets, indicates a good draft. The stove's air inlets are passive; they regulate how much air can enter the stove, but they don't move air into it.

Depending on the features of your installation - steel or masonry chimney, inside or outside the house, matched to the stove's outlet or oversized - your system may warm up quickly, or it may take a while to warm up and operate well. With an 'airtight' stove, one which restricts the amount of air getting into the firebox, the chimney must keep the stove's exhaust warm all the way to the outdoors in order for the stove to work well. Some chimneys do this better than others. Here's a list of features and their effects.

Masonry Chimney
Masonry is a traditional material for chimneys, but it can perform poorly when it serves an 'airtight' stove. Masonry is a very effective 'heat sink' - it absorbs a lot of heat. It can cool the chimney gases enough to diminish draft. The bigger the chimney, the longer it takes to warm up. It's often very difficult to warm up an outdoor masonry chimney, especially an oversized one, and keep it warm enough to maintain an adequate draft.

Steel Chimney
Most factory-made steel chimneys have a layer of insulation around the inner flue. This insulation keeps the chimney warm. The insulation is less dense than masonry, so a steel chimney warms up more quickly than a masonry chimney. Steel doesn't have the good looks of masonry, but it performs much better.

Indoor/Outdoor Location
Because the chimney must keep the smoke warm, it's best to locate it inside the house. This uses the house as insulation for the flue and allows some heat release into the home. An indoor chimney won't lose its heat to the outdoors, so it takes less heat from the stove to heat it up and keep it warm.

Single Venting
Each 'airtight' stove requires its own flue. If an airtight stove is vented to a flue that also serves an open fireplace, or a leakier stove, it's easier for the chimney draft to pull air in through those channels and performance of the stove suffers. Imagine a vacuum cleaner with a hole in the hose to understand the effect here. In some cases the other appliance can even cause a negative draft through the stove, and result in a dangerous draft reversal.

Chimney Height
The common wisdom tells us that a taller flue draws better than a short one. A rule of thumb for minimum height states that the total system height (from the floor the appliance is mounted on to the top of the chimney) should never be less than 4.6 m (15 ft.). Most normal installations exceed this height, but installations in cottages with shallow-pitch roofs may not. Don't make a chimney taller unless you must in order to meet the safety rules, or unless there's some nearby feature causing a downdraft. Even then, there are downdraft-preventing chimney caps available, which are probably the smarter choice.

Flue Sizing
The inside size of a chimney for an 'airtight' stove should match the size of the stove's flue outlet. When a chimney serves an airtight stove, more is not better; in fact, it can be a disadvantage. Hot gases lose heat faster as they travel slower through a chimney; if we vent a stove with a six-inch flue collar (28 square inch area) into a 10 x 10" flue, the gases slow to one third their original speed. This allows the gases to cool more rapids, which weakens draft strength. If an oversized flue is also outside the house, the heat it absorbs gets transferred to the outdoor air and the flue usually stays cool.

It is common for a masonry flue, especially one serving a fireplace, to be oversized for the stove. It can take quite a while to warm up such a flue, and the results can be disappointing. The best solution to an oversized flue is an insulated steel chimney liner, the same diameter as the stove or inserts flue outlet; the liner keeps the exhaust warm, and the result is a stronger draft. An non-insulated liner is a second choice - the liner keeps the exhaust restricted to its original size, but the hot gases still must warm up the air around the liner. This makes the warm-up process take longer.

Pipe & Chimney Layout
Every turn the exhaust must take as it travels to the chimney top will slow it down. The ideal pipe and chimney layout is to vent vertically into a completely straight and vertical chimney. If you are starting from scratch, use this layout if possible. If the stovepipe must elbow to enter a chimney, locate the thimble about midway between the stove top and the ceiling. This achieves several goals: it allows the gases to speed up before they must turn, it leaves some pipe in the room for heat transfer, and it gives you long-term flexibility for installing a different stove without relocating the thimble.

There should be no more than eight feet of single-wall stove pipe between the stove and a chimney; longer runs can cool the exhaust enough to cause draft and creosote problems. With prefabricated chimney, bring it down to six to eight feet from the stove. With a masonry chimney, arrange the pipe so that it turns into the chimney within eight feet of the stove.

B. Venting Components

Chimney Connector: It is also known as flue pipe or appliance pipe. The chimney connector joins the appliance to the chimney. It must be a 6" (152 mm) minimum diameter 24 gauge mild steel black or 26 gauge blued steel, or an approved air-insulated double wall venting pipe.

Thimble: A manufactured or site-constructed device installed in combustible walls through which the chimney connector passes to the chimney. It is intended to keep the walls from igniting. Site constructed thimbles must meet NFPA 211 Standards. Prefabricated must be suitable for use with selected chimney and meet UL103 Type HT Standards. Follow instructions provided by the manufacturer for manufactured thimbles for masonry chimney and prefabricated chimneys.

Chimney: The chimney can be new or existing, masonry or prefabricated and must meet the following minimum requirements specified in Section 4B.

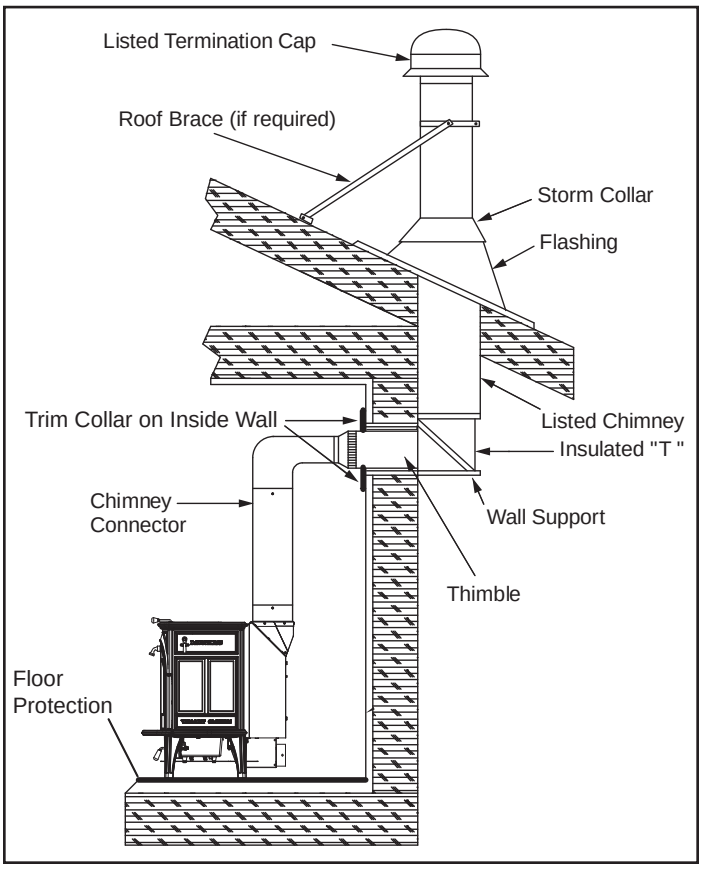


Figure 4.1 - Prefabricated Exterior Chimney

C. Chimney Systems

Prefabricated Metal Chimney

- Must be minimum 6" (152 mm) diameter (ID) high temperature chimney listed to UL 103 HT (2100 °F) or ULC S629M.
- Must use components required by the manufacturer for installation.
- Must maintain clearances required by the manufacturer for installation.
- Refer to manufacturers instructions for installation.

NOTE: In Canada when using a factory-built chimney it must be safety listed, **Type UL103 HT (2100 °F) CLASS "A"** or conforming to **CAN/ULC-S629M, STANDARD FOR 650 °C FACTORY-BUILT CHIMNEYS.**

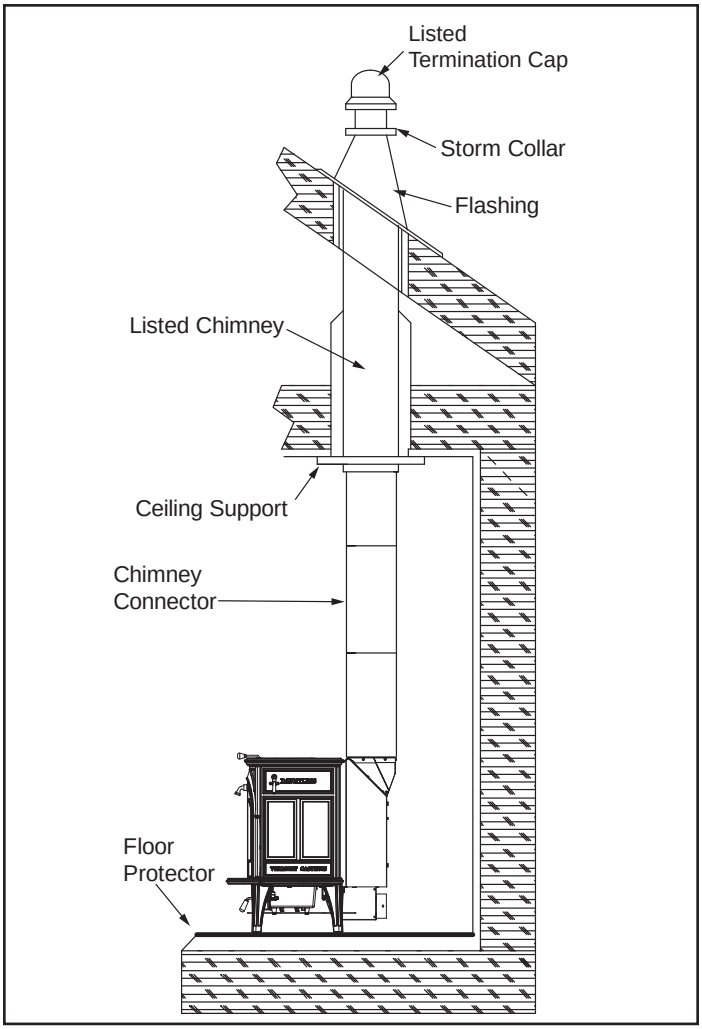


Figure 4.2 - Prefabricated Interior Chimney

Thimble

Site constructed for masonry chimney installation:

Components

- A minimum length of 12” (305 mm) (longer for thicker walls) of solid insulated factory-built chimney length constructed to UL 103 Type HT 6” (152 mm) inside diameter. Chimney needs to extend a minimum of 2” (51 mm) from the interior wall and a minimum of 1” (25 mm) from the exterior wall.
- Wall spacer, trim collar and wall band to fit solid pack chimney selected.
- Minimum 8” (203 mm) diameter clay liner section (if not already present in chimney) and refractory mortar.
- When jurisdiction requires install approved chimney liner in masonry chimney.

Air Clearances

- Masonry chimney clearance must meet NFPA 211 minimum requirement of 2” (51 mm) to sheet metal supports and combustibles.
- Minimum of 1” (25 mm) clearance around the chimney connector.
- Top of wall opening is a minimum of 13-1/2” (343 mm) from ceiling or 4-1/2” (114 mm) below minimum clearance specified by chimney connector manufacturer. NFPA 211 minimum vertical clearance of 18” (457mm) from chimney connector and ceiling or minimum recommended by chimney connector manufacturer, Figure 4.3

Instructions

1. Open inside wall at proper height for the chimney connector to enter the masonry chimney, Figure 4.3
2. Entry hole to masonry chimney must be lined with an 8” (203 mm) minimum diameter clay liner, or equivalent, secured with refractory mortar.
3. Construct a 17” x 17” (432 mm x 432 mm) outside dimension frame from 2 x 2 framing lumber to fit into wall opening. Inside opening of frame should be no less than 14” x 14” (356 mm x 356 mm), Figure 4.4.
   Attach the wall spacer to the chimney side of the frame.
5. Nail the frame into the wall opening. The spacer should be on the chimney side.
6. Insert the section of the solid insulated chimney into the outer wall of the masonry chimney.
7. Tightly secure the length of the solid insulated chimney with the wall band to the masonry chimney.
8. Insert a section of chimney connector into the chimney. Make sure it does not protrude past the edge of the clay chimney liner inside the chimney.
9. Seal the end of the chimney connector to the clay liner with refractory mortar.
10. Install trim collar around the sold pack chimney section.

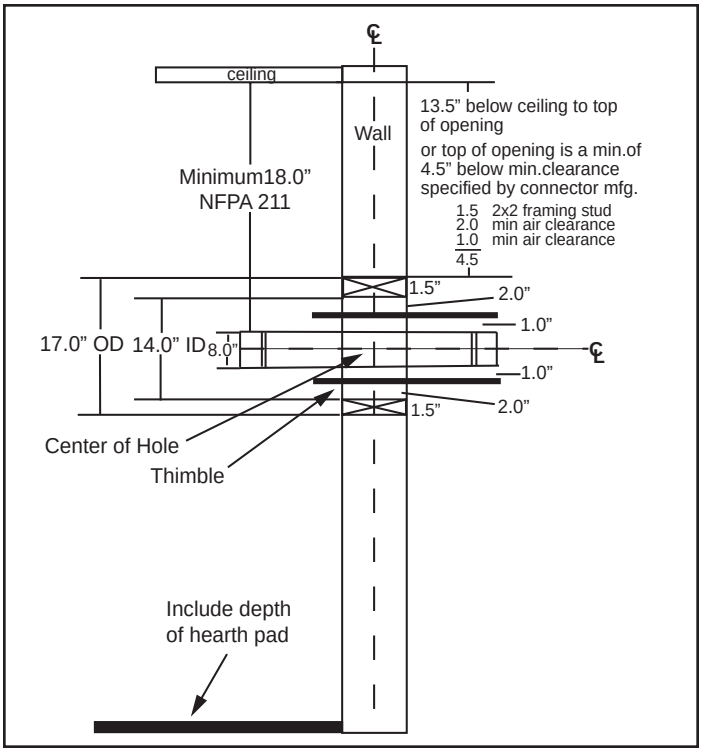


Figure 4.3

Solid Pack Chimney with Metal Supports as a Thimble

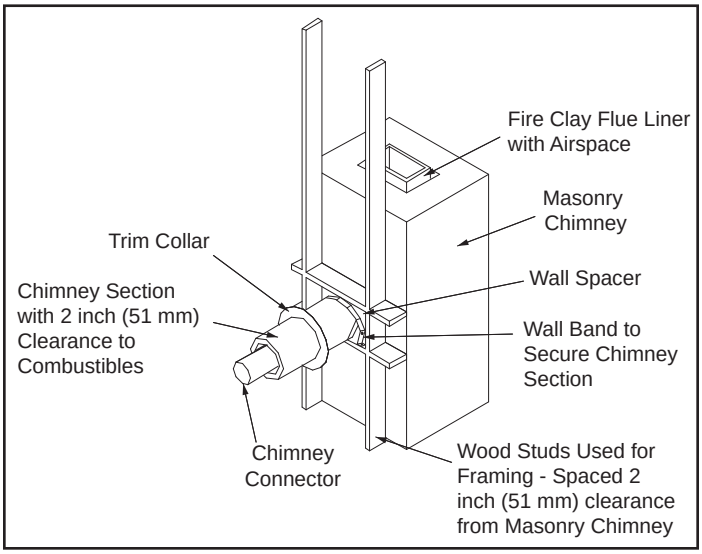


Figure 4.4

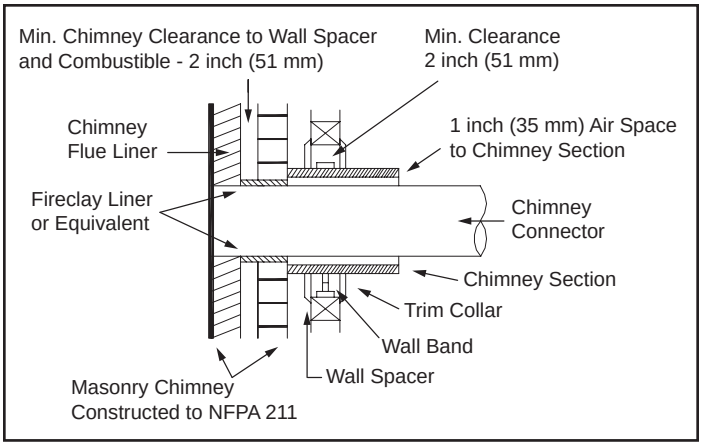


Figure 4.5

WARNING

Fire Risk

Do NOT pack insulation or other combustibles between spacers.

- ALWAYS maintain specified clearances around venting and spacers.
- Install spacers as specified.

Failure to keep insulation or other material away from vent pipe may cause fire.

WARNING

Fire Risk

Inspection of Chimney:

- Chimney must be in good condition.
- Meets minimum standard of NFPA 211
- Factory-built chimney must be 6" (152mm) UL103 HT.

WARNING

Asphyxiation Risk

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

May allow flue gases to enter the house.

WARNING

Improper installation, adjustment, alteration, service or maintenance can cause injury or property damage. Refer to the owner's information manual provided with this appliance. For assistance or additional information consult a qualified installer, service agency or your dealer.

D. Installing Chimney Components

Chimney Connector

Single wall connector or appliance pipe

This must be at least 24 gauge mild steel or 26 gauge blue steel. The sections must be attached to the appliance and to each other with the crimped (male) end pointing toward the appliance. All joints, including the connection at the flue collar, should be secured with 3 sheet metal screws. Make sure to follow the minimum clearances to combustibles. Where passage through the wall, or partition of combustible construction is desired in Canada, the installation shall conform to CAN/CSA-B365.

Factory-built (Double-Wall) listed chimney connector

A listed connector (vented) must be used when installing this appliance in a mobile home. The listed connectors must conform to each other to ensure a proper fit and seal.

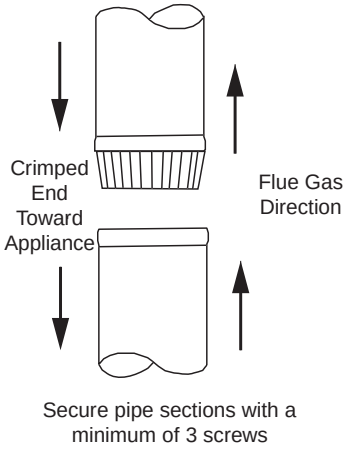


Figure 4.6 - Chimney Connector (Appliance Pipe)

WARNING

Fire Risk

Follow Chimney Connector Manufacturer's Instructions for Proper Installation.

ONLY use connector:

- Within the room, between appliance and ceiling or wall.

Connector shall NOT pass through:

- Attic or roof space
- Closet or similar concealed space
- Floor or ceiling

Maintain minimum clearances to combustibles

5 Appliance Set-Up

A. Removing Unit from Skid

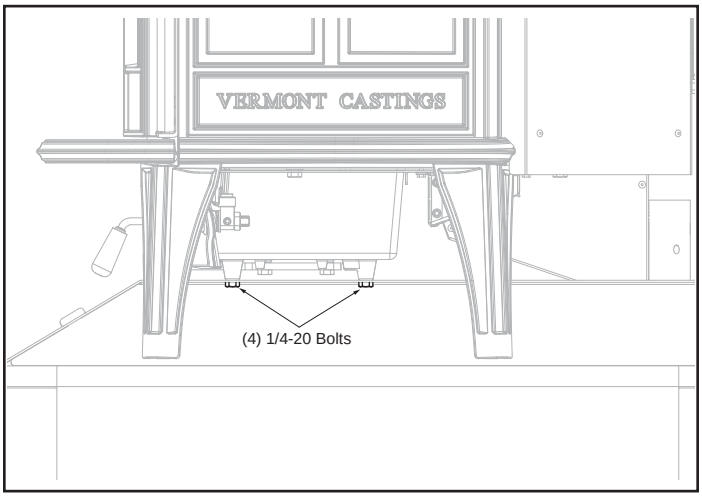


Figure 5.1 - Remove unit from shipping brackets.

Remove the unit from the shipping brackets by removing (2) 1/4-20 hex head bolts from each shipping bracket, leaving brackets attached to the skid, Figure 5.1. (Save the 1/4-20 hex head bolts as they will be needed later to install heat shield.)

NOTE: When moving the stove, lift the stove to take weight off the legs whenever possible. Dragging or sliding the stove, especially across rough surfaces can cause the legs to break.

B. Assembly

Set Up Your Stove

Cast iron stoves are heavy, and it will take two to four people to move your Dauntless FlexBurn into position.

Wipe the protective coating of oil from the griddle with a clean dry rag or a paper towel.

Install the handle on the griddle. Open front door and push up on griddle and assemble the handle, Figure 5.2.

With the handle pointing 45° from its final position, tighten the nut as far as possible with the pliers. Move the handle to its final position while still holding the nut with the pliers.

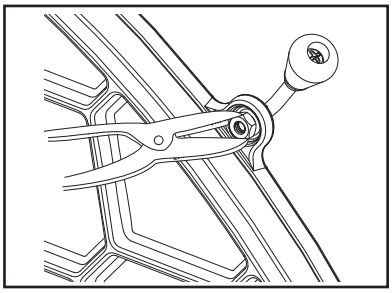


Figure 5.2 - Attach the griddle handle.

> **⚠ CAUTION**
>
> Overtightening can strip tapped threads.

Install the Bottom Heat Shield

NOTE: The Bottom Heat Shield is required in most installations. Refer to Floor Protection, in the Dimensions and Clearances Section of this manual for further details.

1. Align the bottom heat shield holes with the four bolts removed from the shipping brackets
2. Pass all four bolts through the large end of the keyholes and then pulling the shield forward to engage the smaller ends of the keyhole slots, Figure 5.3.
3. Attach the heat shield sides by passing the slots over the bolt heads. Tighten the hex head bolts.

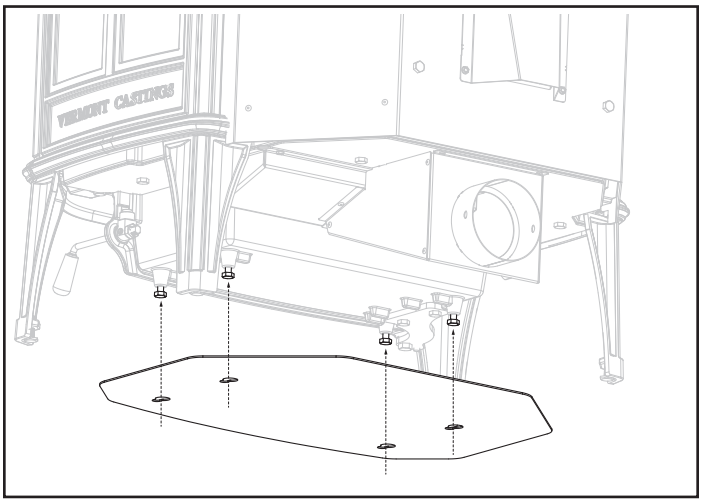


Figure 5.3 - Attach the bottom heat shield.

Adjust the Leg Levelers

Lift the stove slightly so there is no weight on the leg while making the adjustment.

> **⚠ WARNING**
>
> The flue collar heat shield must be installed in all installations.

Attach the Damper Handle

Use the 1/4"-20 x 3" screw to attach the damper handle to the damper stub on the left side.

Assemble the Removable Insert Handle

The wooden removable insert handle opens and closes the front doors. Remove after each use, and store it in the handle holder behind the left front leg. Assemble the handle by passing the 3-3/8” screw through the wooden shaft and into the bright metal nub, Figure 5.4. Tighten carefully until snug.

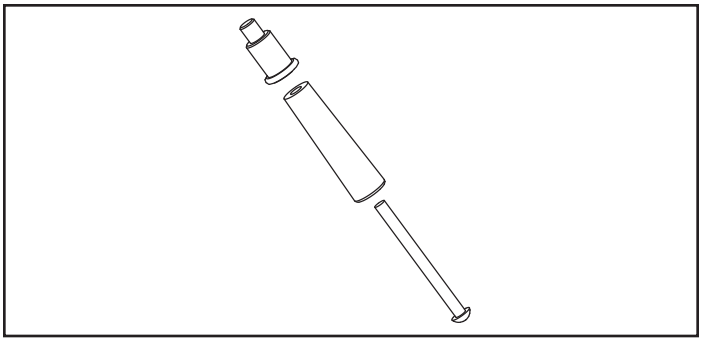


Figure 5.4 - Assemble the fall away door handle.

Storing the Handle

Use the removable handle to open or close the doors. After using it, remove the handle so it will not get hot. Store the handle in the handle holder installed behind the left front leg, Figure 5.5.

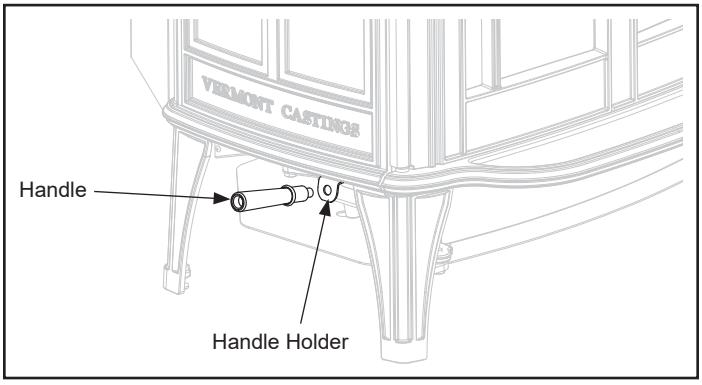


Figure 5.5 - Handle holder and heat shield positions.

C. Installing Optional Catalyst

1. Locate the access cover positioned at the rear center of the unit, Figure 5.6.
2. Remove the access cover by pulling straight up and out, Figure 5.7.
3. Install the catalyst by gently placing it into the cavity and straight down, Figure 5.8. Place the catalyst where the catalyst's ceramic components will not be damaged.

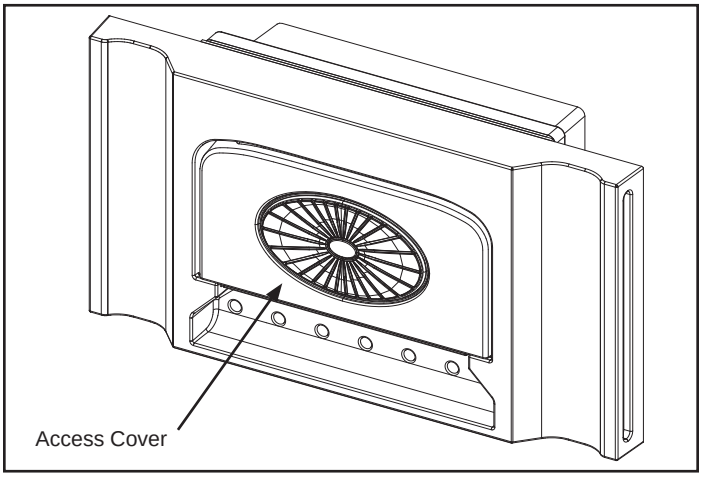


Figure 5.6 - Locate access cover.

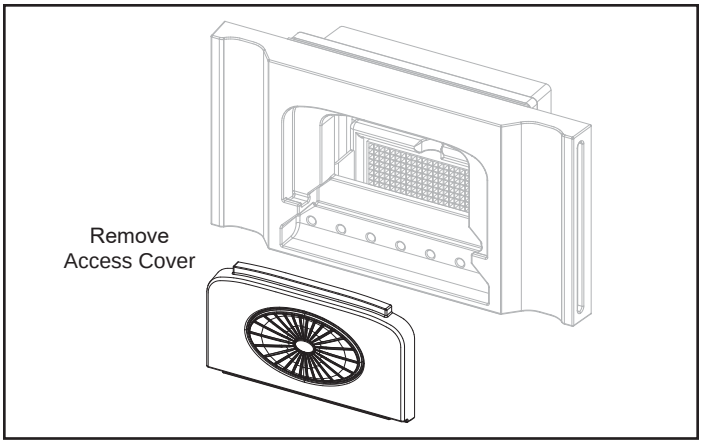


Figure 5.7 - Remove access cover.

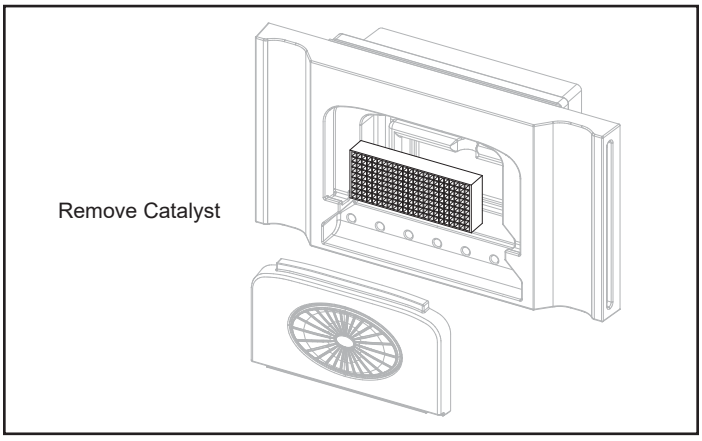


Figure 5.8 - Remove catalyst.

Attach the Catalyst Temperature Probe

If the catalytic performance pack has been purchased, install the catalyst temperature probe, remove the knockout located at the back left hand side of the unit, Figure 5.9. Once knockout is removed, drill a hole using the 3/16" Drill bit supplied in the dimple located just behind the air jacket. Install thermostat duct, bracket and temperature probe using (2) #8 Tek screws also supplied in the kit. Lastly, make sure to fold the bracket strap over catalyst probe and secure with remaining screw.

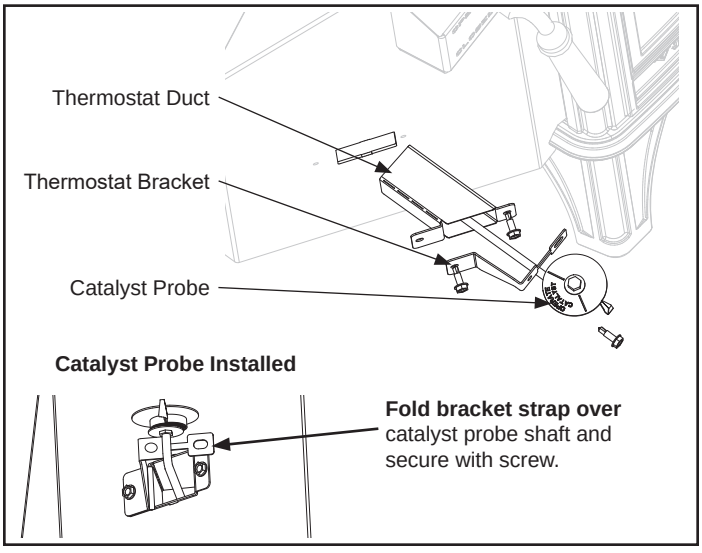


Figure 5.9 - Install the Catalyst Temperature Probe

D. Smoke and CO Detectors & Safety Tips

Smoke and CO Detectors

The use of smoke and carbon monoxide (CO) detectors throughout the home is strongly advised, even if not required by building codes or insurance regulations. It is a good idea to install a smoke detector in the living areas and each bedroom. Follow the smoke/CO detector manufactures placement and installation instructions and maintain regularly.

You may not, however, wish to install a detector in the immediate vicinity of the stove. Depending on the sensitivity of the unit, the alarm can be set off while you are tending the fire or emptying the ashes. If you install a detector in the same room, locate it as far away from the stove as possible.

Safety Tips

Conveniently locate a “Class A” fire extinguisher to contend with small fires. Be sure the fire extinguisher works and is clearly visible. All occupants of the house should know where it is, and how it operates. Have heavy stove gloves available near the stove. Have special safety accessories (e.g., Child Guard Screen) available for use if small children will be in the home.

In the event of a stove pipe or chimney fire….

- Evacuate the house immediately
- Notify the fire department
- If the fire isn’t too threatening, closing down the stove tight, (damper, primary air, all doors) will help to smother the fire.
- Inspect your stove, vent pipe and chimney for any damage caused by the fire and correct any damage before using your stove again.

⚠ WARNING

Fire Risk

- Do not leave the fire unattended when the door is unlatched or when using the fire screen.
- Unstable firewood could fall out of the firebox creating a fire hazard to your home.

F. Reverse the Flue Collar (If necessary)

Tools Required: Phillips head screwdriver.

The flue collar is reversible for either a top or rear venting installation. The appliance is shipped with the flue collar in the top vent position.

Converting Collar For Rear Vent Installation

1. Remove (10) #8 Tek screws from the heat shield cover and heat shield. Remove heat shield and cover, Figure 5.10.
2. Remove (2) 1/4-20 pan head screws from the flue collar. Remove flue collar, Figure 5.10.
3. Turn flue collar to horizontal position. Inspect rope gasket located on the rear cast housing to ensure a leak free seal. Re-install flue collar, heat shield and heat shield cover, Figure 5.11.

Note: There is a knockout on the rear air jacket that will need to be removed prior to installing the flue collar for it to fit properly to the unit, Figure 5.11.

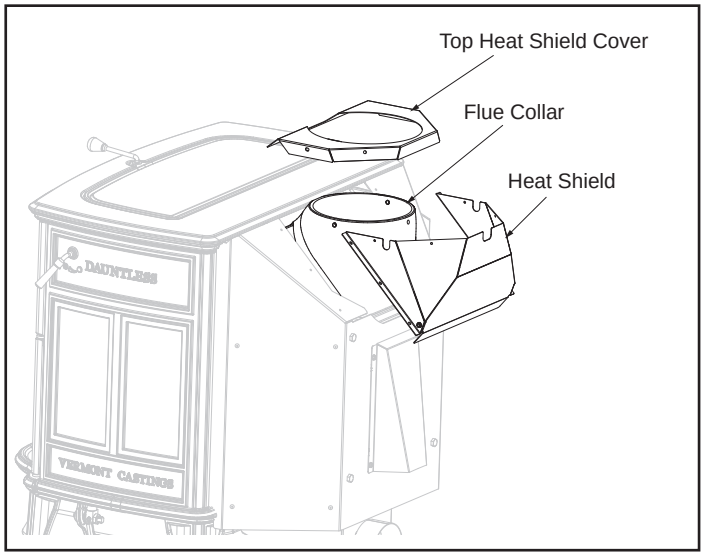


Figure 5.10

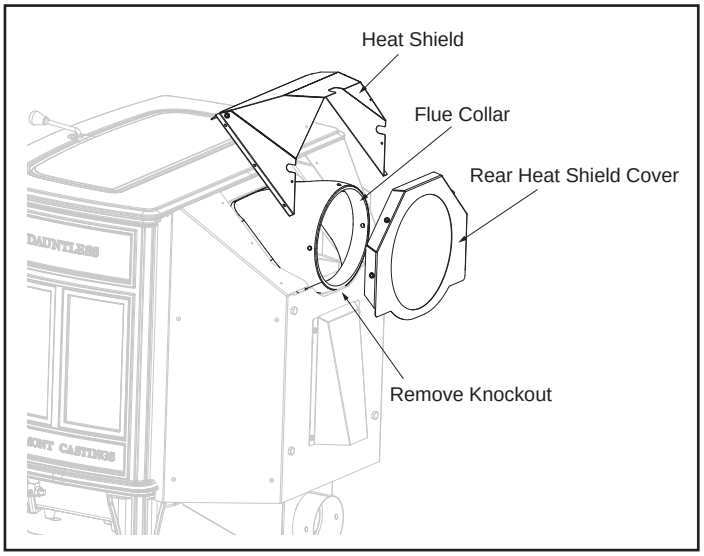


Figure 5.11

G. Outside Air Kit Installation

A source of air (oxygen) is necessary in order for combustion to take place. Whatever combustion air is consumed by the fire must be replaced. Air is replaced via air leakage around windows and under doors. In homes that have tightly sealed doors and windows, an outside air source is needed. An optional Outside Air Kit is available.

Items Needed for Installation (not supplied)

- Phillips head screw driver
- Outside air shield
- Wire ties
- Plastic outside air vent
- Flex / Rigid pipe
- Silicone sealant
- Drills and saws necessary for cutting holes through the wall or flooring in your home.

1. Remove all materials from packing box.
2. Using a #2 Phillips screw driver attach the flex adapter to the appliance using 4 screws. Figure 5.12 & 5.13.
3. Floor & Rear Installation: Cut a 3" (76 mm) hole in outside wall or floor to accommodate outside air piping. Use 3" (76 mm) aluminum metal flex or rigid piping to directly connect outside air to appliance intake. Use the supplied termination cap with a rodent screen. Seal between the wall (or floor) and the pipe with silicone to prevent moisture penetration.

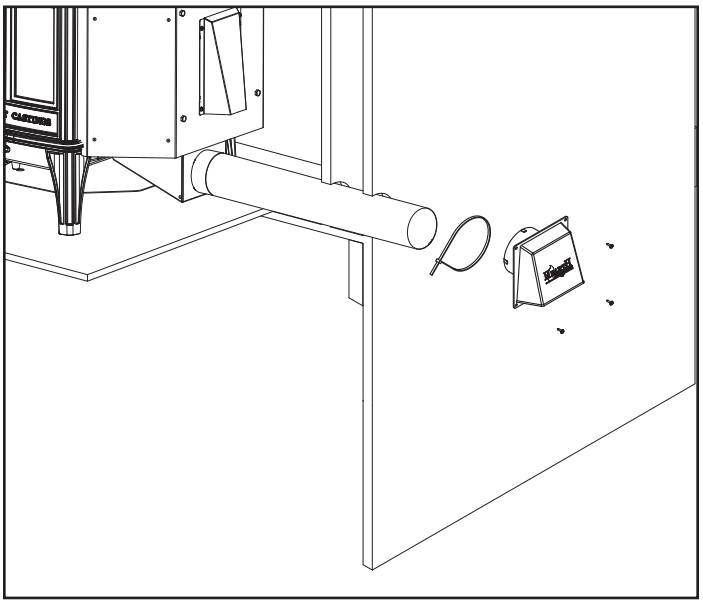


Figure 5.12 - Rear Installation

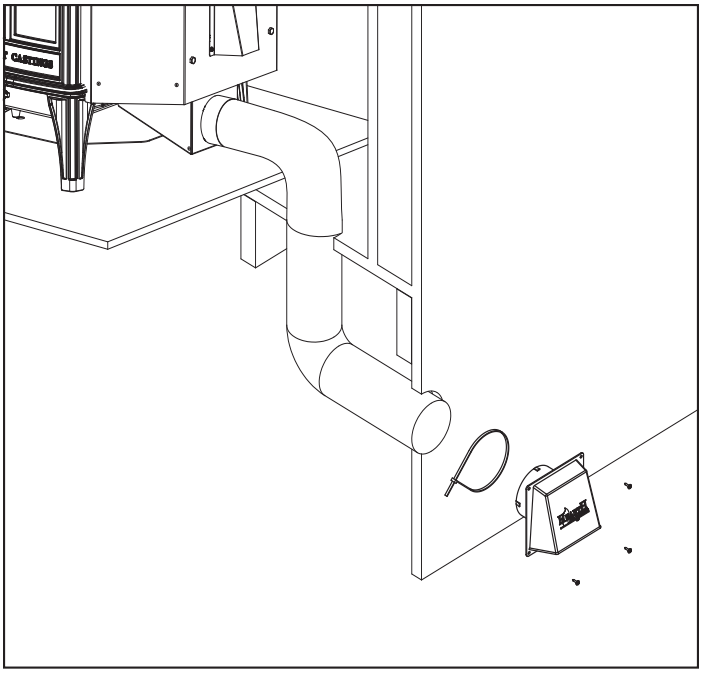


Figure 5.13 - Floor Installation

WARNING

Fire Risk

Asphyxiation Risk

Do not draw outside combustion air from:

- Wall, floor or ceiling cavity
- Enclosed space such as an attic or garage
- Close proximity to exhaust vents or chimneys

Fumes or odor may result

WARNING

Asphyxiation Risk

Outside air inlet must be located to prevent blockage from:

- Leaves
- Snow or ice
- Other debris

Blockage may cause combustion air starvation

Smoke spillage may set off alarms or irritate sensitive individuals.

WARNING

Asphyxiation Risk

Length of outside air supply duct shall NOT exceed the length of the vertical height of the exhaust flue.

- Fire will not burn properly
- Smoke spillage occurs when door is opened due to air starvation

6 Mobile Home Installation - Approved for USA Installation ONLY!

You must use a Vermont Castings Mobile Home Bracket Kit Part #2-00-586189 for installation in a mobile home.

1. An outside air inlet must be provided for combustion.
2. The stove must be permanently secured to the floor using the mobile home brackets supplied in the manual pack along with screws or lag bolts (not supplied), Figure 6.1.

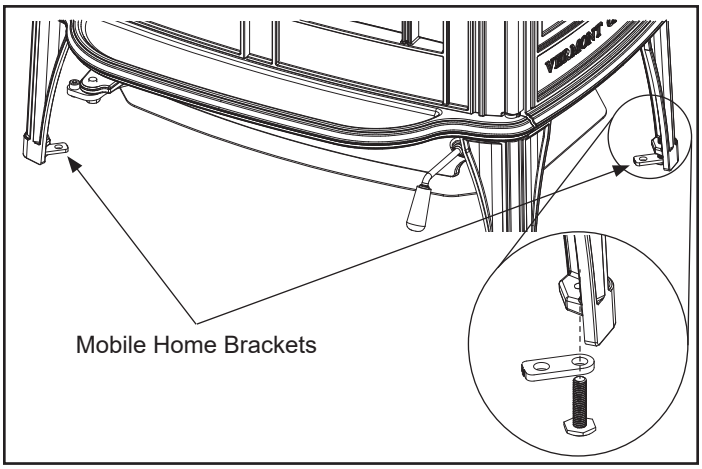


Figure 6.1

3. Appliance must be grounded with #8 solid copper grounding wire or equivalent and terminated at each end with N.E.C. approved grounding device.
4. Appliance must be installed with an approved UL103 HT ventilated chimney connector, UL103 HT chimney, and terminal cap with spark arrestor. Never use a single wall connector (appliance pipe) in a mobile home installation. Use only double-wall connector pipe, Dura-Vent DVL, Selkirk Metalbestos DS or Security DL double-wall connector or any listed double-wall connector pipe.
5. In Canada, this appliance must be connected to a 6" (152 mm) factory-built chimney conforming to CAN/ULC-629M, STANDARD FOR FACTORY BUILT CHIMNEYS.
6. Follow the chimney and chimney connector manufacturer's instructions when installing the flue system for use in a mobile home.
7. Maintain clearance to combustibles.
8. Floor protection requirements must be followed precisely.
9. Use silicone to create an effective vapor barrier at the location where the chimney or other component penetrates to the exterior of the structure.

NOTE: Offsets from the vertical, not exceeding 45°, are allowed per Section 905(a) of the Uniform Mechanical Code (UMC). Offsets greater than 45° are considered horizontal and are also allowed, providing the horizontal run does not exceed 75% of the vertical height of the vent. Construction, clearance and termination must be in compliance with the UMC Table 9C. This installation must also comply with NFPA 211.

NOTE: Top sections of chimney must be removable to allow maximum clearance of 13.5 feet (411cm) from ground level for transportation purposes.

10. Burn wood only. Other types of fuels may generate poisonous gases (e.g., carbon monoxide).
11. If appliance burns poorly while an exhaust blower is on in home, (i.e., range hood), increase combustion air.
12. Installation shall be in accordance with the Manufacturers Home & Safety Standard (HUD) CFR 3280, Part 24.

⚠ CAUTION

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

Do NOT cut through:

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

⚠ WARNING

Asphyxiation Risk

NEVER INSTALL IN A SLEEPING ROOM.

Consumes oxygen in the room.

VERMONT CASTINGS

CONTACT INFORMATION

Hearth & Home Technologies
352 Mountain House Road
Halifax, PA 17032

Please contact your Vermont Castings dealer with any questions or concerns.

For the number of your nearest Vermont Castings dealer

log onto www.vermontcastings.com

CAUTION

DO NOT DISCARD THIS MANUAL

- Important operating and maintenance instructions included.
- Read, understand and follow these instructions for safe installation and operation.
- Leave this manual with party responsible for use and operation.

We recommend that you record the following pertinent information for your heating appliance.

Date purchased/installed: _____

Serial Number: _____ Location on appliance: _____

Dealership purchased from: _____ Dealer phone: _____

Notes: _____

_____

_____

_____

This product may be covered by one or more of the following patents: (United States) 5341794, 5263471, 6688302, 7216645, 7047962 or other U.S. and foreign patents pending.

HEARTH & HOME technologies®

Section 3

Test Data by Run

Conditioning Data

Stove Name: DauntCatCord Test Date: 9/13/2019 Run #: 1 File: DauntCatCord19 Record # Start 5 Stop 150

Test Time	145	min
Wet Wood	8.3	kg
Moisture	21	dry %
Dry Wood	6.86	kg
Coal Bed	1.27	kg
Stove DeltaT	353	deg F
Tunnel CD	0.933	

Avg Stack Gasses (amb Corrected)

CO	0.566	%
CO2	13.01	%
O2	7.51	%
HC	n/m	% as CH4
TCC	1.13	% as CO2

Results

Real Time Data*

Rec #	Tst .ET	Top Tmp F	Rht Avg F	Lft Tmp F	Bak Tmp F	Bot Tmp F	Avg Stove F	Ext1 F	Ext2 F	Ext3 F	Ext4 F	Stk Tmp F	Stk Drft "H2O	Scale kg	10min Drop kg	Stk .O2 %	Stk CO %	Stk CO2 %	Inc CO2 %	CO Fac g/kg	Stk AF	Inc AF	Comb Effic %
0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	0.00	0.00	0.0	0.000	0.0	0.00	0	0.0	0.0	0.0
5	0	67	65	65	67	65	66	65	67	67	67	82	0.000	1.68	-1.68	20.9	0.008	0.0	0.01	0	91.0	90.7	0.0
10	5	123	68	70	68	64	78	66	68	68	68	198	0.000	1.59	0.13	17.9	0.045	3.0	2.77	15	28.0	29.5	97.8
15	10	216	85	87	77	64	106	70	68	68	68	385	0.000	1.36	0.32	14.9	0.089	6.0	5.70	16	16.6	17.3	97.7
20	15	318	113	115	94	66	141	422	68	68	68	526	0.000	1.04	0.50	11.0	0.443	9.7	10.63	53	10.6	9.8	92.8
25	20	288	126	124	117	73	145	1381	68	68	68	416	0.000	3.04	-1.72	7.7	0.137	13.1	11.78	11	8.4	9.2	98.3
30	25	283	141	137	173	90	165	1403	71	69	69	455	0.000	2.63	-1.77	7.6	0.355	13.1	13.69	31	8.3	7.9	95.6
35	30	290	156	143	189	124	181	1471	71	71	71	466	0.000	2.31	0.64	6.8	0.053	14.1	13.92	4	7.9	8.0	99.5
40	35	310	172	159	228	161	206	1518	71	71	71	484	0.000	1.90	0.69	7.3	0.049	13.6	14.05	3	8.2	8.0	99.5
45	40	337	187	172	254	202	230	1485	74	72	72	486	0.000	1.59	0.63	7.6	0.132	13.3	13.30	11	8.3	8.4	98.4
50	45	374	213	192	263	229	254	1351	72	72	72	413	0.000	5.62	-3.76	8.2	0.115	12.6	12.26	9	8.7	8.9	98.6
55	50	331	227	194	259	261	254	1647	75	72	75	509	0.000	9.07	-7.57	5.7	2.016	14.3	14.07	166	7.0	7.1	80.7
60	55	316	227	201	285	283	263	1678	75	75	75	533	0.000	8.62	0.81	4.8	1.544	15.4	15.47	118	6.7	6.6	85.4
65	60	316	227	214	290	296	269	1678	77	75	75	528	0.000	8.16	0.82	5.1	2.016	14.8	14.88	160	6.8	6.7	81.3
70	65	318	230	230	297	312	277	1723	77	75	75	531	0.000	7.76	0.77	5.0	1.579	15.2	15.25	122	6.8	6.8	85.0
75	70	319	230	243	306	334	286	1701	78	75	75	535	0.000	7.35	0.72	4.8	1.938	15.2	15.22	150	6.6	6.6	82.2
80	75	321	228	256	323	367	299	1717	78	76	78	533	0.000	6.94	0.77	5.1	0.809	15.5	15.56	61	7.0	7.0	91.8
85	80	328	235	269	328	400	312	1697	80	76	78	527	0.000	6.62	0.64	5.6	0.237	15.3	15.54	17	7.3	7.2	97.5
90	85	337	235	282	330	424	322	1693	78	76	78	525	0.000	6.26	0.63	5.8	0.122	15.1	15.02	8	7.4	7.5	98.8
95	90	350	239	298	320	441	330	1686	79	79	79	523	0.000	5.85	0.68	6.2	0.086	14.7	15.10	6	7.6	7.4	99.2
100	95	387	248	311	328	450	345	1665	79	77	79	517	0.000	5.53	0.64	6.5	0.070	14.4	14.39	5	7.8	7.8	99.3
105	100	409	255	333	322	455	355	1632	79	77	79	515	0.000	5.17	0.63	7.0	0.051	13.9	14.49	3	8.0	7.7	99.6
110	105	433	262	346	316	453	362	1691	79	79	79	511	0.000	4.81	0.63	6.5	0.070	14.4	14.92	4	7.8	7.5	99.4
115	110	440	266	360	329	453	370	1714	82	79	79	533	0.000	4.49	0.59	6.3	0.089	14.6	14.73	6	7.7	7.6	99.1
120	115	485	279	386	329	451	386	1637	82	80	80	546	0.000	4.04	0.72	5.1	0.310	15.7	15.82	22	7.1	7.1	96.8

Rec #	Tst .ET	Top Tmp F	Rht Avg F	Lft Tmp F	Bak Tmp F	Bot Tmp F	Avg Stove F	Ext1 F	Ext2 F	Ext3 F	Ext4 F	Stk Tmp F	Stk Drft "H2O	Scale kg	10min Drop kg	Stk .O2 %	Stk CO %	Stk CO2 %	Inc CO2 %	CO Fac g/kg	Stk AF	Inc AF	Comb Effic %
125	120	529	306	401	321	444	400	1635	82	80	80	531	0.000	3.63	0.77	5.8	0.623	14.8	15.04	49	7.3	7.3	93.3
130	125	529	321	406	317	436	402	1659	82	80	80	527	0.000	3.27	0.68	5.3	1.220	15.0	15.09	95	7.0	7.0	87.8
135	130	523	328	412	330	440	407	1675	82	80	80	516	0.000	2.95	0.63	5.9	0.559	14.8	14.92	44	7.4	7.3	94.0
140	135	518	334	417	328	438	407	1706	82	80	80	514	0.000	2.63	0.54	6.0	0.636	14.6	14.83	50	7.4	7.3	93.1
145	140	542	345	421	323	443	415	1655	82	80	80	508	0.000	2.36	0.54	6.3	0.383	14.5	14.97	30	7.6	7.3	95.8
150	145	557	360	417	317	445	419	1636	82	80	80	493	0.000	2.09	0.50	7.1	0.061	13.8	13.86	4	8.1	8.1	99.5

Rec #	Tst .ET	Top Tmp F	Rht Avg F	Lft Tmp F	Bak Tmp F	Bot Tmp F	Avg Stove F	Ext1 F	Ext2 F	Ext3 F	Ext4 F	Stk Tmp F	Stk Drft "H2O	Scale kg	10min Drop kg	Stk .O2 %	Stk CO %	Stk CO2 %	Inc CO2 %	CO Fac g/kg	Stk AF	Inc AF	Comb Effic %

* Real time data is presented at 5 minute intervals. Average values appearing in this report are based on more frequent measurements

Notes:

Results Table = HHT
Filename = DauntCatCord1909131
Test Stand A
ASTM Maple, nc

Stove Name: DauntCatCord Test Date: 9/13/2019 Run #: 2 File: DauntCatCord19 Record # Start 9 Stop 429

Test Time	420	min
Wet Wood	9.98	kg
Moisture	20.5	dry %
Dry Wood	8.28	kg
Coal Bed	1.36	kg
Stove DeltaT	-145	deg F
Tunnel CD	0.933	

Avg Stack Gasses (amb Corrected)

CO	0.461	%
CO2	8.48	%
O2	12.15	%
HC	n/m	% as CH4
TCC	0.92	% as CO2

Results

Real Time Data*

Rec #	Tst .ET	Top Tmp F	Rht Avg F	Lft Tmp F	Bak Tmp F	Bot Tmp F	Avg Stove F	Ext1 F	Ext2 F	Ext3 F	Ext4 F	Stk Tmp F	Stk Drft "H2O	Scale kg	10min Drop kg	Stk .O2 %	Stk CO %	Stk CO2 %	Inc CO2 %	CO Fac g/kg	Stk AF	Inc AF	Comb Effic %
0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	0.00	0.00	0.0	0.000	0.0	0.00	0	0.0	0.0	0.0
5	5	482	368	389	263	439	388	1218	81	81	81	341	0.000	1.45	0.82	12.0	0.110	8.9	8.90	12	11.9	11.9	98.2
9	0	480	363	387	257	439	385	1175	83	81	81	333	0.000	5.49	-3.40	12.0	0.274	8.8	7.86	35	11.8	13.1	95.1
14	5	402	350	370	261	433	363	1526	81	81	81	372	0.000	11.11	-9.66	8.0	0.672	12.6	12.47	62	8.4	8.5	91.7
19	10	359	335	350	270	418	347	1503	81	81	81	377	0.000	10.88	0.41	9.0	0.153	11.9	11.20	14	9.2	9.7	98.0
24	15	331	320	331	262	398	328	1486	81	81	81	383	0.000	10.61	0.46	9.1	0.164	11.8	11.81	15	9.3	9.2	97.9
29	20	312	309	316	266	383	317	1524	81	81	81	370	0.000	10.34	0.50	9.1	0.098	11.8	11.73	8	9.3	9.3	98.8
34	25	303	301	301	266	373	309	1567	82	79	79	375	0.000	10.07	0.45	8.4	0.133	12.5	12.45	11	8.8	8.8	98.4
39	30	295	297	290	279	362	304	1561	80	80	80	381	0.000	9.84	0.45	8.0	0.422	12.8	12.74	37	8.5	8.5	94.8
44	35	292	292	282	273	353	299	1561	82	80	80	381	0.000	9.57	0.45	8.2	0.212	12.6	12.46	18	8.7	8.8	97.4
49	40	290	293	275	282	340	296	1523	82	80	80	382	0.000	9.30	0.50	8.2	0.114	12.7	12.47	9	8.7	8.8	98.7
54	45	295	291	273	293	336	297	1572	82	80	80	390	0.000	9.07	0.45	7.4	0.258	13.5	13.43	21	8.2	8.2	97.0
59	50	299	291	267	293	330	296	1581	80	80	80	397	0.000	8.80	0.45	7.1	0.391	13.6	13.53	33	8.0	8.0	95.4
64	55	312	291	267	289	328	297	1564	82	80	80	397	0.000	8.53	0.49	7.3	0.231	13.5	13.36	19	8.1	8.3	97.3
69	60	315	289	263	308	323	300	1603	82	82	80	404	0.000	8.21	0.54	6.8	0.902	13.7	13.74	77	7.7	7.9	89.9
74	65	323	291	265	310	321	302	1601	82	80	80	406	0.000	7.94	0.54	6.7	1.338	13.6	13.55	115	7.6	7.6	85.7
79	70	330	291	263	315	319	304	1599	82	80	80	400	0.000	7.66	0.55	7.1	0.486	13.6	13.61	41	8.0	7.8	94.4
84	75	332	293	263	311	317	303	1599	83	80	80	400	0.000	7.44	0.45	7.1	0.734	13.5	13.47	63	7.9	7.9	91.6
89	80	339	293	265	304	319	304	1597	81	83	83	398	0.000	7.17	0.45	7.0	0.916	13.4	13.33	79	7.8	7.9	89.6
94	85	352	298	265	302	317	307	1560	83	81	81	396	0.000	6.94	0.45	7.3	1.076	13.1	13.16	96	7.9	7.9	87.8
99	90	363	304	268	300	320	311	1509	83	81	81	387	0.000	6.71	0.41	8.2	0.441	12.5	12.75	40	8.6	8.5	94.4
104	95	376	309	270	307	318	316	1498	83	83	83	383	0.000	6.53	0.36	8.3	0.441	12.4	12.83	41	8.7	8.4	94.4
109	100	383	313	274	300	320	318	1487	83	83	83	379	0.000	6.26	0.45	8.8	0.348	12.0	12.26	33	9.0	8.8	95.4
114	105	389	320	274	289	318	318	1449	83	83	83	374	0.000	6.08	0.41	9.0	0.211	11.8	11.80	19	9.2	9.2	97.3
119	110	396	322	274	294	318	321	1417	83	83	83	368	0.000	5.90	0.36	9.6	0.208	11.3	11.46	20	9.6	9.4	97.2

Rec #	Tst .ET	Top Tmp F	Rht Avg F	Lft Tmp F	Bak Tmp F	Bot Tmp F	Avg Stove F	Ext1 F	Ext2 F	Ext3 F	Ext4 F	Stk Tmp F	Stk Drft "H2O	Scale kg	10min Drop kg	Stk .O2 %	Stk CO %	Stk CO2 %	Inc CO2 %	CO Fac g/kg	Stk AF	Inc AF	Comb Effic %
124	115	387	326	274	281	318	317	1402	83	83	81	363	0.000	5.76	0.32	9.7	0.086	11.2	11.38	7	9.7	9.6	99.0
129	120	381	331	274	270	318	315	1365	83	83	83	359	0.000	5.58	0.32	10.2	0.067	10.7	10.96	5	10.2	9.9	99.2
134	125	381	333	272	279	318	317	1337	83	83	83	355	0.000	5.40	0.31	10.3	0.084	10.6	10.78	7	10.2	10.1	99.0
139	130	383	340	275	270	316	317	1361	83	83	83	357	0.000	5.26	0.27	9.9	0.082	11.0	10.86	7	9.9	10.0	99.0
144	135	387	342	274	274	314	318	1293	83	83	83	348	0.000	5.08	0.27	10.5	0.104	10.4	10.15	9	10.4	10.5	98.6
149	140	387	348	275	259	314	317	1241	83	83	83	338	0.000	4.99	0.23	11.4	0.384	9.3	9.21	46	11.1	11.3	93.6
154	145	388	351	275	244	312	314	1167	83	83	83	325	0.000	4.85	0.23	12.4	0.334	8.3	8.44	45	12.3	12.2	93.8
159	150	390	355	273	247	307	314	1140	84	84	84	314	0.000	4.72	0.22	12.5	0.309	8.3	8.27	41	12.4	12.4	94.3
164	155	388	351	273	236	305	310	1142	84	81	84	312	0.000	4.58	0.23	12.3	0.339	8.5	8.47	45	12.1	12.1	93.8
169	160	385	353	270	227	305	308	1161	84	81	84	312	0.000	4.49	0.23	12.1	0.379	8.7	8.58	49	11.9	12.0	93.2
174	165	383	353	268	225	303	306	1179	83	81	81	312	0.000	4.35	0.23	11.8	0.280	9.0	8.98	34	11.6	11.6	95.2
179	170	381	355	268	218	303	305	1184	83	81	81	312	0.000	4.26	0.18	11.8	0.251	9.0	9.00	30	11.6	11.6	95.7
184	175	383	353	266	225	301	305	1202	83	81	81	314	0.000	4.13	0.22	11.0	0.120	9.9	9.59	12	10.8	11.1	98.3
189	180	392	351	266	229	301	308	1190	83	81	81	316	0.000	4.04	0.18	11.3	0.236	9.5	9.27	27	11.1	11.3	96.2
194	185	396	351	268	227	301	308	1186	83	81	81	318	0.000	3.90	0.18	11.3	0.172	9.5	9.39	19	11.1	11.3	97.3
199	190	396	351	268	231	303	310	1175	84	81	81	316	0.000	3.81	0.18	11.8	0.197	9.1	9.18	23	11.6	11.5	96.7
204	195	396	351	266	223	301	307	1188	83	81	81	316	0.000	3.67	0.18	11.6	0.086	9.3	9.24	8	11.5	11.5	98.8
209	200	399	351	268	223	301	308	1186	84	81	81	316	0.000	3.58	0.18	11.5	0.083	9.4	8.94	8	11.4	11.8	98.8
214	205	403	348	268	223	299	308	1237	81	81	81	320	0.000	3.45	0.22	11.1	0.125	9.8	9.65	13	10.9	11.1	98.2
219	210	401	349	270	227	297	309	1209	84	82	82	320	0.000	3.31	0.23	11.4	0.079	9.5	9.71	8	11.3	11.0	98.9
224	215	399	346	268	234	297	309	1171	84	82	82	314	0.000	3.22	0.23	12.0	0.087	8.9	8.86	9	11.9	12.0	98.7
229	220	392	346	270	225	296	306	1103	84	82	82	303	0.000	3.08	0.23	12.9	0.293	7.9	8.05	42	12.9	12.9	94.2
234	225	388	342	271	212	294	301	1056	82	82	82	292	0.000	2.99	0.18	13.4	0.271	7.4	7.33	41	13.7	13.8	94.3
239	230	386	342	273	203	294	300	984	84	82	82	283	0.000	2.95	0.13	14.1	0.472	6.6	6.73	81	14.6	14.5	89.4
244	235	383	340	273	210	294	300	935	84	82	82	275	0.000	2.90	0.09	14.2	0.564	6.5	6.44	100	14.7	14.8	87.3
249	240	388	338	273	199	292	298	914	82	82	82	266	0.000	2.86	0.09	14.1	0.639	6.5	6.55	113	14.4	14.6	85.9
254	245	390	336	273	193	292	297	885	82	82	82	260	0.000	2.77	0.13	14.2	0.704	6.4	6.37	128	14.6	14.7	84.4
259	250	409	336	277	188	290	300	856	82	82	82	257	0.000	2.68	0.13	13.5	1.146	6.9	6.94	195	13.2	13.2	78.2
264	255	455	336	288	206	288	314	1188	82	82	82	323	0.000	2.49	0.28	8.0	0.954	12.4	12.24	89	8.3	8.5	88.5
269	260	494	336	299	199	286	323	814	82	82	79	273	0.000	2.40	0.28	13.6	0.977	6.9	7.35	165	13.4	12.3	80.8
274	265	459	331	301	188	281	312	781	82	82	82	253	0.000	2.36	0.09	14.2	0.996	6.2	6.23	187	14.4	14.4	78.9
279	270	438	323	301	178	277	303	747	82	82	79	244	0.000	2.27	0.09	14.4	0.907	6.0	6.08	175	14.8	14.8	80.0
284	275	425	318	301	180	275	300	716	81	79	79	234	0.000	2.27	0.04	14.6	0.866	5.9	5.86	172	15.2	15.3	80.2
289	280	416	314	301	160	270	292	695	82	79	79	229	0.000	2.18	0.09	14.7	0.771	5.9	5.85	152	15.4	15.4	82.0
294	285	414	312	303	163	268	292	678	82	79	79	223	0.000	2.18	0.04	14.8	0.721	5.8	5.84	144	15.7	15.6	82.8
299	290	412	305	303	161	268	290	659	82	79	79	219	0.000	2.13	0.09	14.7	0.647	5.9	5.92	127	15.6	15.5	84.5
304	295	409	303	303	163	264	288	650	79	79	79	216	0.000	2.13	0.05	14.7	0.618	6.0	5.92	120	15.5	15.6	85.2
309	300	407	303	303	156	264	287	640	79	79	79	214	0.000	2.09	0.04	14.7	0.610	6.0	5.90	118	15.6	15.7	85.4
314	305	403	299	303	145	262	282	625	79	79	79	210	0.000	2.04	0.05	14.8	0.591	5.8	5.78	117	15.8	16.0	85.5
319	310	399	297	301	148	262	281	614	79	79	79	208	0.000	2.00	0.09	14.9	0.579	5.7	5.76	116	16.1	16.0	85.6
324	315	394	292	301	141	260	278	608	79	79	79	206	0.000	1.95	0.09	15.0	0.600	5.7	5.69	122	16.2	16.1	85.0
329	320	392	290	301	143	257	277	597	79	79	79	203	0.000	1.95	0.05	15.0	0.600	5.7	5.68	122	16.1	16.2	85.0
334	325	388	286	301	141	255	274	591	79	79	79	201	0.000	1.90	0.05	15.0	0.595	5.6	5.61	123	16.3	16.3	84.9
339	330	383	283	296	137	253	270	582	79	79	79	199	0.000	1.86	0.09	15.1	0.603	5.5	5.53	126	16.4	16.5	84.6
344	335	379	281	296	147	253	271	575	79	79	77	197	0.000	1.81	0.09	15.1	0.596	5.5	5.47	125	16.5	16.6	84.7
349	340	374	279	296	143	253	269	567	79	77	77	192	0.000	1.81	0.05	15.2	0.602	5.4	5.43	128	16.6	16.7	84.4
354	345	370	277	294	137	251	266	560	79	79	77	192	0.000	1.81	0.05	15.2	0.590	5.4	5.38	126	16.7	16.8	84.6

Rec #	Tst .ET	Top Tmp F	Rht Avg F	Lft Tmp F	Bak Tmp F	Bot Tmp F	Avg Stove F	Ext1 F	Ext2 F	Ext3 F	Ext4 F	Stk Tmp F	Stk Drft "H2O	Scale kg	10min Drop kg	Stk .O2 %	Stk CO %	Stk CO2 %	Inc CO2 %	CO Fac g/kg	Stk AF	Inc AF	Comb Effic %
359	350	366	274	292	130	251	262	554	79	79	77	190	0.000	1.77	0.04	15.4	0.600	5.2	5.26	132	17.1	17.2	83.9
364	355	363	272	292	134	251	262	545	79	79	77	186	0.000	1.68	0.09	15.4	0.596	5.2	5.19	132	17.2	17.3	83.9
369	360	361	270	292	138	248	262	534	79	77	77	186	0.000	1.63	0.09	15.4	0.613	5.2	5.19	136	17.2	17.2	83.6
374	365	361	270	287	136	248	261	528	79	77	77	184	0.000	1.63	0.05	15.5	0.591	5.1	5.11	134	17.5	17.5	83.8
379	370	359	265	285	130	246	257	521	79	77	77	181	0.000	1.63	0.00	15.6	0.567	5.1	5.10	128	17.5	17.6	84.4
384	375	357	265	283	136	246	257	513	77	77	77	177	0.000	1.59	0.04	15.6	0.558	5.1	5.08	125	17.5	17.7	84.6
389	380	357	263	281	128	244	254	506	77	77	77	175	0.000	1.59	0.04	15.6	0.579	5.0	5.00	133	17.7	17.8	83.8
394	385	354	261	278	132	244	254	500	77	77	77	175	0.000	1.54	0.05	15.6	0.570	5.0	5.03	131	17.7	17.7	84.1
399	390	352	261	278	130	244	253	495	76	76	76	175	0.000	1.54	0.05	15.7	0.556	4.9	4.93	131	18.0	18.0	84.1
404	395	352	259	276	125	239	250	499	76	76	76	172	0.000	1.50	0.04	15.8	0.636	4.8	4.79	153	18.1	18.2	81.9
409	400	349	258	273	127	237	249	497	76	76	76	170	0.000	1.50	0.00	15.9	0.610	4.8	4.79	148	18.3	18.3	82.5
414	405	349	256	273	131	234	249	495	76	76	76	170	0.000	1.45	0.05	15.9	0.595	4.7	4.75	145	18.4	18.4	82.7
419	410	347	254	271	125	234	246	496	76	76	76	169	0.000	1.41	0.04	15.9	0.586	4.7	4.76	143	18.5	18.4	82.9
424	415	342	253	269	118	232	243	492	75	75	75	169	0.000	1.41	0.04	16.0	0.568	4.7	4.59	141	18.7	19.0	83.1
429	420	340	251	266	120	229	241	483	75	73	75	167	0.000	1.36	0.05	16.2	0.551	4.5	4.54	141	19.3	19.1	83.0

Rec #	Tst .ET	Top Tmp F	Rht Avg F	Lft Tmp F	Bak Tmp F	Bot Tmp F	Avg Stove F	Ext1 F	Ext2 F	Ext3 F	Ext4 F	Stk Tmp F	Stk Drft "H2O	Scale kg	10min Drop kg	Stk .O2 %	Stk CO %	Stk CO2 %	Inc CO2 %	CO Fac g/kg	Stk AF	Inc AF	Comb Effic %

* Real time data is presented at 5 minute intervals. Average values appearing in this report are based on more frequent measurements

Notes:

Results Table = HHT
Filename = DauntCatCord1909132
Test Stand A
ASTM Maple,

Stove Name: DauntCatCord Test Date: 9/16/2019 Run #: 1 File: DauntCatCord19 Record # Start 5 Stop 166

Test Time	161	min
Wet Wood	8.16	kg
Moisture	21	dry %
Dry Wood	6.74	kg
Coal Bed	1.18	kg
Stove DeltaT	332	deg F
Tunnel CD	0.933	

Avg Stack Gasses (amb Corrected)

CO	0.642	%
CO2	11.09	%
O2	9.41	%
HC	n/m	% as CH4
TCC	1.28	% as CO2

Results

Real Time Data*

Rec #	Tst .ET	Top Tmp F	Rht Avg F	Lft Tmp F	Bak Tmp F	Bot Tmp F	Avg Stove F	Ext1 F	Ext2 F	Ext3 F	Ext4 F	Stk Tmp F	Stk Drft "H2O	Scale kg	10min Drop kg	Stk .O2 %	Stk CO %	Stk CO2 %	Inc CO2 %	CO Fac g/kg	Stk AF	Inc AF	Comb Effic %
0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	0.00	0.00	0.0	0.000	0.0	0.00	0	0.0	0.0	0.0
5	0	74	72	72	68	70	71	72	72	72	72	112	0.000	1.63	-1.63	20.8	0.015	0.1	0.01	0	85.4	91.4	100.0
10	5	155	78	80	83	70	93	72	72	74	72	244	0.000	1.54	0.14	17.5	0.066	3.4	3.52	17	25.3	24.9	97.6
15	10	242	98	93	76	72	116	79	72	72	72	337	0.000	1.32	0.31	15.4	0.169	5.4	5.08	33	17.7	18.8	95.3
20	15	342	128	117	98	77	152	89	72	75	75	407	0.000	1.00	0.50	13.7	0.163	7.2	6.51	24	14.2	15.4	96.5
25	20	357	149	132	96	79	163	446	75	75	75	285	0.000	2.95	-1.68	15.8	0.164	5.1	5.74	34	18.7	17.0	95.2
30	25	309	160	135	120	92	163	1031	75	75	75	357	0.000	3.08	-2.08	11.6	0.377	9.2	9.10	47	11.3	11.4	93.6
35	30	292	165	139	145	109	170	1050	75	75	75	353	0.000	2.81	0.46	12.1	0.503	8.6	8.82	67	11.8	11.6	91.0
40	35	271	169	141	165	124	174	1248	75	75	75	394	0.000	2.54	0.50	13.1	0.201	7.8	9.52	28	13.2	11.1	96.0
45	40	275	176	148	174	141	183	1147	75	75	75	416	0.000	2.27	0.50	11.5	0.542	9.2	9.30	68	11.1	11.1	91.0
50	45	280	180	157	182	152	190	1184	78	76	76	377	0.000	1.95	0.54	13.9	0.711	6.6	6.50	125	14.2	14.3	84.7
55	50	280	183	163	200	167	199	1416	78	76	76	430	0.000	1.72	0.50	9.4	0.059	11.5	10.54	4	9.5	10.3	99.4
60	55	295	187	174	204	180	208	1219	78	76	78	423	0.000	1.45	0.50	12.9	0.269	7.9	8.02	38	13.0	12.7	94.7
65	60	319	196	194	209	187	221	1151	78	76	76	410	0.000	1.22	0.41	13.0	0.519	7.7	7.40	77	12.9	13.4	89.8
70	65	300	198	200	202	200	220	1592	78	76	76	443	0.000	8.98	-7.57	7.3	2.016	12.6	13.62	187	7.7	7.2	78.9
75	70	291	196	205	237	215	229	1610	78	76	76	489	0.000	8.53	-7.21	5.6	0.972	14.8	14.55	76	7.2	6.9	90.0
80	75	298	198	215	257	228	239	1545	78	78	78	499	0.000	8.03	0.86	5.8	2.016	14.2	14.26	167	7.0	7.0	80.6
85	80	311	203	233	270	242	252	1590	79	77	77	504	0.000	7.57	0.87	6.0	2.016	13.9	14.13	170	7.1	7.0	80.4
90	85	322	207	248	272	257	261	1614	79	79	79	517	0.000	7.12	0.82	5.5	1.594	14.6	14.81	128	7.0	7.0	84.4
95	90	346	211	268	292	272	278	1632	79	79	79	521	0.000	6.71	0.77	5.9	0.424	14.9	14.94	32	7.4	7.4	95.5
100	95	387	220	285	294	290	295	1606	79	79	79	530	0.000	6.21	0.82	5.3	2.016	14.6	14.70	162	6.8	6.8	81.1
105	100	442	233	314	296	303	318	1466	79	79	79	545	0.000	5.76	0.82	5.0	1.102	15.4	15.58	84	6.9	6.8	89.1
110	105	511	251	344	301	316	344	1375	79	79	79	539	0.000	5.40	0.72	6.1	0.866	14.5	14.58	69	7.4	7.3	90.8
115	110	563	270	377	310	325	369	1373	81	79	79	537	0.000	4.94	0.77	5.8	0.796	14.8	14.83	63	7.3	7.3	91.6
120	115	582	292	403	284	331	379	1277	82	80	80	501	0.000	4.54	0.77	6.6	0.999	13.9	12.86	84	7.6	8.1	89.1

Rec #	Tst .ET	Top Tmp F	Rht Avg F	Lft Tmp F	Bak Tmp F	Bot Tmp F	Avg Stove F	Ext1 F	Ext2 F	Ext3 F	Ext4 F	Stk Tmp F	Stk Drft "H2O	Scale kg	10min Drop kg	Stk .O2 %	Stk CO %	Stk CO2 %	Inc CO2 %	CO Fac g/kg	Stk AF	Inc AF	Comb Effic %
125	120	589	303	425	275	336	386	1283	82	80	80	483	0.000	4.22	0.63	8.1	0.775	12.5	12.48	72	8.4	8.4	90.5
130	125	593	316	447	277	336	394	1334	82	80	80	488	0.000	3.90	0.59	7.5	0.607	13.1	13.40	53	8.2	8.1	92.8
135	130	595	323	464	269	338	398	1422	82	80	80	488	0.000	3.54	0.59	7.4	0.117	13.5	13.45	8	8.2	8.2	98.8
140	135	596	330	473	262	341	400	1465	82	80	80	484	0.000	3.27	0.54	7.5	0.064	13.4	13.39	4	8.3	8.3	99.4
145	140	598	336	477	271	340	404	1525	82	80	82	486	0.000	2.95	0.50	7.1	0.055	13.8	13.98	3	8.1	8.0	99.5
150	145	594	341	480	276	343	407	1453	82	80	80	475	0.000	2.68	0.54	8.0	0.049	12.9	12.47	3	8.6	8.9	99.6
155	150	592	343	478	271	341	405	1436	82	80	80	469	0.000	2.45	0.45	8.9	0.047	12.0	12.05	3	9.2	9.2	99.6
160	155	596	347	471	259	343	403	1415	83	80	80	467	0.000	2.22	0.41	8.2	0.055	12.7	12.50	3	8.7	8.8	99.5
165	160	590	363	460	256	343	402	1370	83	80	80	454	0.000	2.00	0.40	9.3	0.052	11.6	12.01	3	9.5	9.2	99.5
166	161	590	367	460	267	341	405	1345	83	83	83	450	0.000	1.95	0.41	9.3	0.052	11.6	11.19	3	9.5	9.8	99.5

Rec #	Tst .ET	Top Tmp F	Rht Avg F	Lft Tmp F	Bak Tmp F	Bot Tmp F	Avg Stove F	Ext1 F	Ext2 F	Ext3 F	Ext4 F	Stk Tmp F	Stk Drft "H2O	Scale kg	10min Drop kg	Stk .O2 %	Stk CO %	Stk CO2 %	Inc CO2 %	CO Fac g/kg	Stk AF	Inc AF	Comb Effic %

* Real time data is presented at 5 minute intervals. Average values appearing in this report are based on more frequent measurements

Notes:

Results Table = HHT
Filename = DauntCatCord1909161
Test Stand A
ASTM Beech, High

Stove Name: DauntCatCord Test Date: 9/16/2019 Run #: 2 File: DauntCatCord19 Record # Start 19 Stop 436

Test Time	417	min
Wet Wood	10.24	kg
Moisture	21	dry %
Dry Wood	8.46	kg
Coal Bed	1.41	kg
Stove DeltaT	-138	deg F
Tunnel CD	0.933	

Avg Stack Gasses (amb Corrected)

CO	0.437	%
CO2	8.22	%
O2	12.41	%
HC	n/m	% as CH4
TCC	0.87	% as CO2

Results

Real Time Data*

Rec #	Tst .ET	Top Tmp F	Rht Avg F	Lft Tmp F	Bak Tmp F	Bot Tmp F	Avg Stove F	Ext1 F	Ext2 F	Ext3 F	Ext4 F	Stk Tmp F	Stk Drft "H2O	Scale kg	10min Drop kg	Stk .O2 %	Stk CO %	Stk CO2 %	Inc CO2 %	CO Fac g/kg	Stk AF	Inc AF	Comb Effic %
0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	0.00	0.00	0.0	0.000	0.0	0.00	0	0.0	0.0	0.0
5	5	515	389	413	215	337	374	1098	83	81	81	328	0.000	1.63	0.50	13.0	0.378	7.7	7.72	55	13.0	13.0	92.5
10	10	493	387	402	215	335	366	958	83	81	81	313	0.000	1.59	0.13	13.5	0.584	7.2	6.93	94	13.5	13.8	88.0
15	15	482	385	389	211	335	360	874	81	81	81	293	0.000	1.50	0.13	14.1	0.604	6.6	6.53	106	14.5	14.5	86.6
19	0	480	385	383	205	333	357	807	81	81	81	294	0.000	2.09	-0.50	14.4	0.493	6.3	6.40	89	15.1	14.8	88.5
24	5	396	374	363	207	331	334	1189	83	81	81	320	0.000	11.47	-9.97	11.5	0.350	9.3	9.19	42	11.2	11.3	94.1
29	10	346	355	341	224	324	318	1339	81	81	79	339	0.000	11.29	0.37	10.6	0.123	10.3	9.88	12	10.4	10.8	98.3
34	15	313	333	320	229	316	302	1447	81	81	81	359	0.000	11.02	0.45	9.8	0.062	11.1	11.29	4	9.8	9.7	99.4
39	20	290	313	303	233	309	290	1434	83	81	81	372	0.000	10.79	0.46	9.2	0.059	11.7	11.71	4	9.4	9.4	99.4
44	25	279	298	290	246	303	283	1417	81	81	79	372	0.000	10.52	0.46	9.9	0.057	11.0	10.97	4	9.9	10.0	99.4
49	30	270	285	279	253	298	277	1390	81	79	81	374	0.000	10.29	0.46	10.7	0.055	10.2	10.35	4	10.6	10.5	99.4
54	35	261	274	272	246	292	269	1411	81	81	81	372	0.000	10.07	0.41	10.5	0.053	10.5	10.58	4	10.4	10.3	99.4
59	40	257	266	264	257	285	266	1432	81	81	81	374	0.000	9.84	0.41	10.5	0.055	10.5	10.42	4	10.4	10.4	99.5
64	45	255	260	260	249	281	261	1481	81	81	81	379	0.000	9.61	0.41	9.9	0.056	11.1	11.13	4	9.9	9.8	99.4
69	50	255	253	255	251	279	259	1503	81	81	81	385	0.000	9.34	0.46	9.4	0.058	11.5	11.37	4	9.5	9.6	99.4
74	55	255	249	251	255	277	258	1520	82	82	82	392	0.000	9.12	0.40	9.3	0.058	11.7	11.69	4	9.4	9.4	99.4
79	60	260	247	249	277	275	262	1574	82	82	82	397	0.000	8.84	0.46	8.4	0.069	12.5	12.11	5	8.8	9.1	99.3
84	65	266	247	251	286	273	265	1646	82	82	82	431	0.000	8.57	0.45	6.6	1.237	13.7	13.72	106	7.6	7.4	86.7
89	70	282	247	251	299	273	270	1668	84	82	82	416	0.000	8.25	0.55	8.2	0.306	12.6	12.90	27	8.6	8.4	96.2
94	75	290	247	255	303	275	274	1670	82	82	82	418	0.000	8.03	0.45	7.6	0.343	13.1	13.12	29	8.3	8.3	95.9
99	80	299	247	260	301	273	276	1607	82	82	82	412	0.000	7.76	0.45	7.9	0.243	12.9	13.24	20	8.5	8.2	97.1
104	85	310	251	264	299	275	280	1553	82	82	82	403	0.000	7.53	0.41	9.1	0.076	11.8	11.79	6	9.3	9.3	99.2
109	90	318	251	271	299	275	283	1559	82	82	82	397	0.000	7.30	0.41	9.4	0.073	11.5	11.66	5	9.5	9.4	99.2
114	95	336	251	275	288	277	285	1570	84	82	82	403	0.000	7.07	0.41	9.3	0.067	11.6	11.81	5	9.5	9.3	99.3
119	100	368	256	284	297	279	297	1454	84	82	82	392	0.000	6.85	0.41	10.1	0.061	10.8	11.21	5	10.1	9.8	99.3

Rec #	Tst .ET	Top Tmp F	Rht Avg F	Lft Tmp F	Bak Tmp F	Bot Tmp F	Avg Stove F	Ext1 F	Ext2 F	Ext3 F	Ext4 F	Stk Tmp F	Stk Drft "H2O	Scale kg	10min Drop kg	Stk .O2 %	Stk CO %	Stk CO2 %	Inc CO2 %	CO Fac g/kg	Stk AF	Inc AF	Comb Effic %
124	105	358	258	286	284	279	293	1475	84	82	84	388	0.000	6.67	0.36	9.9	0.057	11.0	11.18	4	9.9	9.8	99.5
129	110	355	258	290	277	277	292	1488	84	82	82	386	0.000	6.44	0.36	9.5	0.253	11.3	11.41	24	9.5	9.5	96.5
134	115	355	258	295	275	280	293	1523	84	82	82	386	0.000	6.26	0.36	9.2	0.069	11.7	11.57	5	9.4	9.5	99.3
139	120	355	258	297	282	279	294	1563	84	82	84	390	0.000	6.03	0.36	8.6	0.283	12.2	12.04	26	8.9	9.1	96.3
144	125	364	258	306	280	280	297	1609	84	82	82	403	0.000	5.90	0.31	7.7	0.276	13.1	13.34	23	8.3	8.3	96.7
149	130	401	260	316	290	279	309	1605	84	82	84	418	0.000	5.62	0.37	6.7	0.788	13.9	13.94	66	7.7	7.7	91.2
154	135	518	269	334	299	282	340	1538	84	82	82	429	0.000	5.31	0.49	6.0	1.195	14.4	14.29	97	7.3	7.1	87.6
159	140	567	280	351	303	282	357	1546	84	84	82	425	0.000	4.99	0.59	6.5	0.794	14.0	14.07	65	7.6	7.1	91.3
164	145	546	293	356	306	280	356	1463	84	84	84	406	0.000	4.76	0.46	7.6	0.101	13.3	12.90	7	8.3	8.6	99.0
169	150	535	299	358	295	275	352	1370	84	84	84	386	0.000	4.58	0.36	9.9	0.205	11.0	10.98	20	9.8	9.9	97.1
174	155	522	308	356	275	275	347	1427	84	84	84	388	0.000	4.40	0.32	9.3	0.112	11.6	11.73	9	9.4	9.3	98.7
179	160	514	314	356	273	273	346	1510	84	82	82	397	0.000	4.17	0.37	7.5	0.635	13.2	12.80	55	8.1	8.5	92.5
184	165	503	319	353	280	269	345	1538	84	82	82	406	0.000	3.90	0.41	6.7	2.011	13.2	13.18	179	7.4	7.6	79.6
189	170	514	323	353	286	269	349	1491	84	82	84	399	0.000	3.67	0.46	8.2	0.308	12.6	12.91	27	8.6	8.3	96.2
194	175	527	330	356	280	267	352	1488	84	82	84	388	0.000	3.49	0.36	8.3	0.299	12.5	12.33	27	8.7	8.8	96.2
199	180	535	332	358	275	267	353	1378	84	82	84	377	0.000	3.36	0.31	9.7	0.174	11.1	11.15	16	9.7	9.7	97.7
204	185	537	334	360	271	267	354	1359	84	84	82	371	0.000	3.22	0.27	9.7	0.163	11.2	11.10	15	9.7	9.8	97.8
209	190	531	336	362	254	264	349	1332	84	82	82	366	0.000	3.08	0.23	10.1	0.269	10.7	10.85	28	10.0	9.9	96.1
214	195	570	343	366	254	262	359	1032	84	82	82	336	0.000	2.95	0.22	12.1	1.338	8.2	8.15	191	11.3	11.4	78.5
219	200	544	345	369	243	260	352	970	84	82	82	316	0.000	2.86	0.18	13.2	0.914	7.2	7.30	147	13.0	12.8	82.5
224	205	507	345	362	223	260	339	1011	84	82	82	306	0.000	2.77	0.13	13.3	0.899	7.2	7.33	145	13.1	13.1	82.7
229	210	481	343	360	217	258	332	1001	84	82	82	301	0.000	2.72	0.09	13.0	0.263	7.8	7.83	37	13.1	13.0	94.8
234	215	468	340	356	213	256	327	978	84	82	82	297	0.000	2.68	0.09	13.3	0.256	7.6	7.57	37	13.4	13.5	94.9
239	220	460	340	351	202	256	322	951	82	82	82	290	0.000	2.63	0.09	13.5	0.274	7.3	7.38	42	13.8	13.7	94.2
244	225	451	340	349	200	254	319	917	82	82	82	284	0.000	2.54	0.14	13.7	0.361	7.0	7.01	57	14.1	14.1	92.2
249	230	447	340	345	197	254	317	883	82	82	82	280	0.000	2.49	0.14	13.9	0.443	6.8	6.88	74	14.3	14.3	90.2
254	235	440	342	342	191	251	313	854	82	80	82	273	0.000	2.45	0.09	14.1	0.483	6.6	6.61	83	14.6	14.6	89.2
259	240	436	338	338	178	251	308	821	82	80	80	264	0.000	2.45	0.04	14.3	0.580	6.4	6.38	105	14.8	14.9	86.8
264	245	434	338	336	172	251	306	788	82	80	80	258	0.000	2.40	0.05	14.5	0.639	6.1	6.14	120	15.1	15.2	85.2
269	250	429	336	334	178	249	305	758	82	80	80	251	0.000	2.36	0.09	14.7	0.680	5.9	6.02	132	15.4	15.3	84.0
274	255	425	334	332	163	247	300	733	82	80	80	247	0.000	2.31	0.09	14.8	0.688	5.8	5.82	136	15.7	15.7	83.6
279	260	421	332	329	174	247	300	710	82	80	80	240	0.000	2.27	0.09	14.9	0.653	5.7	5.76	133	16.0	15.9	83.9
284	265	414	329	325	161	245	295	689	82	80	80	236	0.000	2.22	0.09	15.0	0.639	5.6	5.62	131	16.2	16.2	84.0
289	270	412	327	323	167	243	294	672	82	80	80	232	0.000	2.22	0.05	15.1	0.628	5.5	5.56	132	16.5	16.4	84.0
294	275	407	327	318	159	243	291	655	80	80	80	227	0.000	2.18	0.09	15.2	0.615	5.4	5.42	131	16.7	16.7	84.1
299	280	403	323	316	161	243	289	644	80	80	80	223	0.000	2.13	0.09	15.3	0.609	5.3	5.40	131	16.9	16.7	84.1
304	285	399	318	312	156	240	285	631	80	80	80	221	0.000	2.13	0.05	15.4	0.615	5.3	5.27	134	17.0	17.0	83.8
309	290	392	318	310	154	236	282	619	80	80	80	219	0.000	2.09	0.04	15.4	0.608	5.2	5.23	133	17.1	17.1	83.8
314	295	390	316	307	141	236	278	608	79	79	79	214	0.000	2.04	0.05	15.5	0.595	5.2	5.13	132	17.3	17.4	83.9
319	300	388	314	303	141	234	276	597	79	79	79	212	0.000	2.00	0.09	15.6	0.592	5.0	5.03	135	17.7	17.7	83.6
324	305	385	312	301	147	234	276	612	79	79	79	210	0.000	2.00	0.04	15.5	0.739	5.1	5.33	168	17.2	16.4	80.5
329	310	388	309	298	145	234	275	635	79	79	79	212	0.000	1.95	0.05	14.9	0.786	5.6	5.68	162	15.8	15.7	81.1
334	315	387	307	296	143	229	273	652	79	79	79	210	0.000	1.90	0.10	14.9	0.709	5.7	5.70	144	15.9	15.9	82.8
339	320	387	300	294	141	229	270	644	79	77	77	212	0.000	1.86	0.09	15.1	0.659	5.5	5.60	137	16.3	16.2	83.5
344	325	387	303	292	143	227	270	648	79	79	77	212	0.000	1.81	0.09	15.1	0.651	5.5	5.40	137	16.5	16.7	83.4
349	330	383	300	292	147	227	270	626	79	79	79	212	0.000	1.81	0.05	15.6	0.663	5.0	5.06	153	17.5	17.5	82.0
354	335	383	298	287	147	224	268	613	79	77	79	207	0.000	1.77	0.09	15.7	0.643	4.9	4.94	151	17.8	17.8	82.1

Rec #	Tst .ET	Top Tmp F	Rht Avg F	Lft Tmp F	Bak Tmp F	Bot Tmp F	Avg Stove F	Ext1 F	Ext2 F	Ext3 F	Ext4 F	Stk Tmp F	Stk Drft "H2O	Scale kg	10min Drop kg	Stk .O2 %	Stk CO %	Stk CO2 %	Inc CO2 %	CO Fac g/kg	Stk AF	Inc AF	Comb Effic %
359	340	378	296	287	140	222	265	620	79	79	79	207	0.000	1.72	0.09	15.7	0.617	4.9	4.91	146	18.0	18.0	82.6
364	345	376	291	285	144	224	264	598	78	76	76	205	0.000	1.68	0.09	15.9	0.616	4.7	4.70	149	18.3	18.5	82.3
369	350	371	289	282	142	222	261	583	78	76	76	200	0.000	1.68	0.04	16.1	0.593	4.5	4.55	152	19.0	19.0	82.1
374	355	367	287	280	131	220	257	566	78	76	76	200	0.000	1.63	0.05	16.2	0.591	4.4	4.36	156	19.4	19.6	81.7
379	360	362	282	278	142	217	256	553	76	76	76	198	0.000	1.63	0.05	16.5	0.568	4.2	4.26	155	20.1	19.9	81.7
384	365	360	280	273	140	217	254	535	78	76	76	193	0.000	1.63	0.00	16.6	0.548	4.1	4.03	156	20.7	20.8	81.7
389	370	354	278	271	138	215	251	525	78	76	76	191	0.000	1.59	0.04	16.7	0.528	4.0	3.98	154	21.1	21.1	81.9
394	375	349	273	269	137	212	248	514	78	75	75	189	0.000	1.59	0.00	16.8	0.518	3.9	3.86	153	21.4	21.6	81.9
399	380	342	271	264	137	210	245	505	75	75	75	184	0.000	1.54	0.05	17.0	0.505	3.7	3.75	157	22.2	22.0	81.6
404	385	338	266	260	130	210	241	492	75	75	75	182	0.000	1.54	0.05	17.1	0.496	3.6	3.59	158	22.6	22.7	81.5
409	390	331	264	255	126	208	237	479	75	75	75	178	0.000	1.50	0.04	17.3	0.469	3.4	3.39	160	23.8	23.7	81.3
414	395	324	259	251	130	208	234	468	75	75	75	175	0.000	1.50	0.04	17.4	0.456	3.3	3.28	159	24.1	24.3	81.4
419	400	320	255	246	130	203	231	454	75	75	75	171	0.000	1.50	0.00	17.5	0.442	3.2	3.19	160	24.8	24.8	81.3
424	405	313	253	244	115	201	225	444	75	75	75	166	0.000	1.45	0.05	17.6	0.443	3.1	3.08	164	25.1	25.4	80.9
429	410	309	248	239	123	198	224	437	74	74	74	166	0.000	1.45	0.05	17.6	0.435	3.1	3.09	162	25.3	25.3	81.1
434	415	302	246	235	121	196	220	426	74	74	74	162	0.000	1.45	0.00	17.7	0.422	3.0	2.95	161	25.9	26.2	81.2
436	417	302	244	235	117	196	219	421	74	74	74	162	0.000	1.41	0.04	17.8	0.416	2.9	2.92	163	26.2	26.4	81.0

Rec #	Tst .ET	Top Tmp F	Rht Avg F	Lft Tmp F	Bak Tmp F	Bot Tmp F	Avg Stove F	Ext1 F	Ext2 F	Ext3 F	Ext4 F	Stk Tmp F	Stk Drft "H2O	Scale kg	10min Drop kg	Stk .O2 %	Stk CO %	Stk CO2 %	Inc CO2 %	CO Fac g/kg	Stk AF	Inc AF	Comb Effic %

* Real time data is presented at 5 minute intervals. Average values appearing in this report are based on more frequent measurements

Notes:

Results Table = HHT
Filename = DauntCatCord1909162
Test Stand A
ASTM beech, Low

Stove Name: DauntCatCord Test Date: 9/19/2019 Run #: 1 File: DauntCatCord19 Record # Start 4 Stop 149

Test Time	145	min
Wet Wood	7.99	kg
Moisture	21	dry %
Dry Wood	6.60	kg
Coal Bed	1.32	kg
Stove DeltaT	329	deg F
Tunnel CD	0.933	

Avg Stack Gasses (amb Corrected)

CO	0.449	%
CO2	11.70	%
O2	8.89	%
HC	n/m	% as CH4
TCC	0.90	% as CO2

Results

Real Time Data*

Rec #	Tst .ET	Top Tmp F	Rht Avg F	Lft Tmp F	Bak Tmp F	Bot Tmp F	Avg Stove F	Ext1 F	Ext2 F	Ext3 F	Ext4 F	Stk Tmp F	Stk Drft "H2O	Scale kg	10min Drop kg	Stk .O2 %	Stk CO %	Stk CO2 %	Inc CO2 %	CO Fac g/kg	Stk AF	Inc AF	Comb Effic %
0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	0.00	0.00	0.0	0.000	0.0	0.00	0	0.0	0.0	0.0
4	0	72	66	68	66	66	68	66	68	68	68	121	0.000	0.54	-0.54	20.9	0.011	0.0	0.01	0	91.5	91.4	0.0
9	5	139	72	75	75	66	85	68	70	68	68	222	0.000	1.36	-1.36	17.9	0.109	3.0	3.09	39	27.7	27.3	94.5
14	10	233	85	90	85	66	112	75	68	68	68	444	0.000	1.09	0.36	15.3	0.214	5.5	6.15	44	17.5	15.9	93.9
19	15	346	115	120	103	69	150	90	71	71	71	669	0.000	0.63	0.69	9.3	0.358	11.4	9.83	36	9.4	10.7	95.0
24	20	333	128	137	101	75	155	652	71	71	71	299	0.000	2.81	-1.77	15.9	0.888	4.6	6.03	229	18.1	14.9	75.5
29	25	292	131	137	111	88	152	1231	71	71	71	360	0.000	2.54	-2.00	11.4	0.402	9.3	7.42	49	11.1	13.4	93.2
34	30	275	137	142	152	103	162	1340	71	71	71	425	0.000	2.22	0.55	8.8	0.105	12.1	12.18	9	9.1	9.0	98.7
39	35	291	146	157	174	120	178	1259	71	71	71	414	0.000	1.90	0.59	10.4	0.515	10.3	10.09	58	10.1	10.3	92.2
44	40	310	153	176	176	136	190	1228	72	72	72	410	0.000	1.63	0.55	10.8	0.408	9.9	9.66	47	10.5	10.8	93.5
49	45	330	161	198	192	157	208	1253	72	72	72	417	0.000	1.36	0.50	10.2	0.181	10.6	10.94	19	10.1	9.9	97.3
54	50	311	168	209	205	181	215	1543	74	72	72	458	0.000	9.02	-7.43	7.1	0.463	13.6	13.87	39	7.9	7.7	94.5
59	55	307	170	220	222	203	224	1453	72	72	72	497	0.000	8.62	-5.08	6.3	0.623	14.4	14.22	50	7.5	7.4	93.1
64	60	318	175	240	248	220	240	1489	74	72	72	511	0.000	8.21	0.72	5.8	0.283	15.0	15.07	21	7.4	7.4	97.0
69	65	333	179	266	274	238	258	1615	75	75	75	519	0.000	7.76	0.77	5.3	0.235	15.5	15.20	17	7.2	7.4	97.6
74	70	346	186	288	285	255	272	1637	75	73	73	522	0.000	7.30	0.82	6.0	0.121	14.9	14.99	8	7.5	7.5	98.8
79	75	364	195	310	290	275	287	1570	75	75	75	535	0.000	6.89	0.77	5.6	0.123	15.3	15.28	8	7.3	7.3	98.8
84	80	375	201	329	290	290	297	1617	75	75	75	535	0.000	6.44	0.77	5.7	0.126	15.2	15.19	9	7.4	7.4	98.7
89	85	390	212	349	299	312	312	1642	77	75	75	535	0.000	6.03	0.77	5.9	0.088	15.0	15.10	6	7.5	7.4	99.2
94	90	405	217	362	306	327	323	1646	77	75	75	544	0.000	5.58	0.77	5.0	0.258	15.9	15.71	18	7.0	7.1	97.4
99	95	432	228	382	306	343	338	1631	78	78	76	531	0.000	5.17	0.77	6.4	0.304	14.4	14.50	24	7.7	7.7	96.6
104	100	484	243	406	304	356	359	1444	78	78	78	531	0.000	4.81	0.68	5.7	0.897	14.8	14.47	71	7.2	7.5	90.6
109	105	534	258	432	293	365	376	1376	78	76	78	540	0.000	4.35	0.77	5.2	2.016	14.8	15.09	161	6.8	6.7	81.2
114	110	559	278	449	293	365	389	1489	78	78	78	534	0.000	3.95	0.77	5.7	0.742	14.8	14.74	58	7.3	7.0	92.1
119	115	560	304	448	293	365	394	1592	81	78	78	530	0.000	3.54	0.72	5.5	1.171	14.9	14.70	92	7.1	7.2	88.1

Rec #	Tst .ET	Top Tmp F	Rht Avg F	Lft Tmp F	Bak Tmp F	Bot Tmp F	Avg Stove F	Ext1 F	Ext2 F	Ext3 F	Ext4 F	Stk Tmp F	Stk Drft "H2O	Scale kg	10min Drop kg	Stk .O2 %	Stk CO %	Stk CO2 %	Inc CO2 %	CO Fac g/kg	Stk AF	Inc AF	Comb Effic %
124	120	551	315	452	283	363	393	1483	81	78	78	504	0.000	3.22	0.63	6.5	0.326	14.3	13.94	26	7.7	8.0	96.3
129	125	586	328	465	283	363	405	1245	81	79	79	480	0.000	2.90	0.59	9.4	0.524	11.3	12.36	54	9.4	8.9	92.7
134	130	599	335	478	248	363	405	1098	81	79	79	441	0.000	2.68	0.45	10.9	1.236	9.4	9.30	155	10.3	10.4	81.8
139	135	597	342	487	242	361	406	1119	79	79	79	424	0.000	2.49	0.37	11.1	1.142	9.3	9.14	144	10.4	10.5	82.7
144	140	584	342	489	227	357	400	1239	79	79	79	433	0.000	2.22	0.41	10.7	0.794	9.8	9.96	94	10.3	10.2	87.9
149	145	582	342	485	221	353	396	1243	79	79	79	435	0.000	2.04	0.41	10.6	0.199	10.2	10.31	21	10.5	10.4	96.9

Rec #	Tst .ET	Top Tmp F	Rht Avg F	Lft Tmp F	Bak Tmp F	Bot Tmp F	Avg Stove F	Ext1 F	Ext2 F	Ext3 F	Ext4 F	Stk Tmp F	Stk Drft "H2O	Scale kg	10min Drop kg	Stk .O2 %	Stk CO %	Stk CO2 %	Inc CO2 %	CO Fac g/kg	Stk AF	Inc AF	Comb Effic %

* Real time data is presented at 5 minute intervals. Average values appearing in this report are based on more frequent measurements

Notes:

Results Table = HHT
Filename = DauntCatCord1909191
Test Stand A
ASTM beech, hi, new door gasket

Stove Name: DauntCatCord Test Date: 9/19/2019 Run #: 2 File: DauntCatCord19 Record # Start 18 Stop 403

Test Time	385	min
Wet Wood	9.8	kg
Moisture	21	dry %
Dry Wood	8.10	kg
Coal Bed	1.41	kg
Stove DeltaT	-118	deg F
Tunnel CD	0.933	

Avg Stack Gasses (amb Corrected)

CO	0.354	%
CO2	8.68	%
O2	11.98	%
HC	n/m	% as CH4
TCC	0.71	% as CO2

Results

Real Time Data*

Rec #	Tst .ET	Top Tmp F	Rht Avg F	Lft Tmp F	Bak Tmp F	Bot Tmp F	Avg Stove F	Ext1 F	Ext2 F	Ext3 F	Ext4 F	Stk Tmp F	Stk Drft "H2O	Scale kg	10min Drop kg	Stk .O2 %	Stk CO %	Stk CO2 %	Inc CO2 %	CO Fac g/kg	Stk AF	Inc AF	Comb Effic %
0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	0.00	0.00	0.0	0.000	0.0	0.00	0	0.0	0.0	0.0
5	5	513	336	446	223	340	372	1308	79	79	79	353	0.000	1.68	0.54	9.2	0.345	11.6	11.08	34	9.3	9.6	95.2
10	10	496	331	431	225	336	364	1277	79	79	79	351	0.000	1.54	0.27	10.6	0.186	10.3	10.10	20	10.4	10.6	97.2
15	15	481	329	418	230	329	358	1196	80	80	80	336	0.000	1.50	0.18	12.3	0.282	8.5	8.98	37	12.1	11.7	94.8
18	0	473	327	412	232	325	354	1172	80	80	80	319	0.000	6.39	-4.80	12.4	0.269	8.4	8.33	36	12.3	12.4	94.9
23	5	393	317	384	232	319	329	1382	80	80	80	328	0.000	11.02	-9.57	11.4	0.058	9.5	9.68	6	11.3	11.1	99.2
28	10	347	299	358	232	310	309	1378	80	80	80	343	0.000	10.79	0.41	11.3	0.051	9.6	9.58	4	11.2	11.2	99.4
33	15	315	286	334	234	304	295	1395	80	80	80	358	0.000	10.61	0.37	10.3	0.043	10.6	11.50	3	10.3	9.5	99.6
38	20	295	274	315	239	297	284	1400	80	80	80	363	0.000	10.39	0.40	11.0	0.049	9.9	9.86	4	10.9	10.9	99.4
43	25	282	263	295	252	291	277	1438	80	80	80	371	0.000	10.16	0.41	10.4	0.042	10.5	10.22	3	10.3	10.6	99.6
48	30	276	252	285	246	283	268	1440	81	81	81	376	0.000	9.93	0.41	10.1	0.044	10.8	10.56	3	10.1	10.3	99.6
53	35	283	246	272	261	278	268	1402	81	79	81	378	0.000	9.66	0.45	10.7	0.052	10.2	10.88	4	10.6	10.0	99.4
58	40	287	242	265	252	272	264	1474	81	81	81	385	0.000	9.43	0.46	10.1	0.046	10.8	11.06	3	10.1	9.9	99.5
63	45	296	240	261	259	268	265	1483	81	81	81	385	0.000	9.21	0.45	10.0	0.048	10.9	10.34	3	10.0	10.5	99.5
68	50	300	238	259	272	264	267	1524	81	81	81	400	0.000	8.93	0.46	8.3	0.056	12.6	12.63	4	8.8	8.8	99.5
73	55	305	238	257	279	262	268	1615	81	81	81	407	0.000	8.66	0.46	7.6	0.072	13.3	12.46	5	8.4	8.9	99.3
78	60	316	238	257	288	260	272	1676	81	81	81	429	0.000	8.39	0.50	6.5	0.312	14.3	14.22	24	7.7	7.6	96.5
83	65	325	240	257	303	257	277	1683	81	81	81	435	0.000	8.07	0.55	6.5	0.880	14.0	14.14	73	7.6	7.7	90.3
88	70	331	245	260	307	258	280	1685	82	82	82	444	0.000	7.76	0.54	6.4	0.807	14.2	14.16	66	7.5	7.5	91.2
93	75	353	245	264	314	255	286	1633	84	82	82	423	0.000	7.48	0.55	7.5	0.416	13.3	13.46	35	8.2	8.0	95.1
98	80	377	251	271	310	258	293	1633	84	82	82	421	0.000	7.26	0.50	7.5	0.372	13.2	13.17	32	8.2	8.2	95.5
103	85	390	258	275	310	260	299	1581	84	82	82	412	0.000	7.03	0.45	8.3	0.163	12.6	12.61	14	8.8	8.5	98.0
108	90	408	262	280	308	260	304	1559	82	82	82	408	0.000	6.80	0.41	8.4	0.151	12.4	12.43	13	8.8	8.8	98.2
113	95	408	269	284	308	258	305	1583	84	82	82	412	0.000	6.58	0.40	7.5	0.081	13.4	12.88	6	8.3	8.6	99.2
118	100	406	280	286	293	260	305	1478	82	82	84	397	0.000	6.30	0.46	9.2	0.055	11.7	11.64	4	9.4	9.5	99.5

Rec #	Tst .ET	Top Tmp F	Rht Avg F	Lft Tmp F	Bak Tmp F	Bot Tmp F	Avg Stove F	Ext1 F	Ext2 F	Ext3 F	Ext4 F	Stk Tmp F	Stk Drft "H2O	Scale kg	10min Drop kg	Stk .O2 %	Stk CO %	Stk CO2 %	Inc CO2 %	CO Fac g/kg	Stk AF	Inc AF	Comb Effic %
123	105	419	291	291	297	260	312	1433	84	82	82	389	0.000	6.08	0.45	9.3	0.055	11.6	11.58	4	9.5	9.5	99.5
128	110	415	302	293	287	263	312	1502	85	82	82	391	0.000	5.90	0.40	9.0	0.053	11.9	12.02	3	9.2	9.2	99.5
133	115	406	308	291	285	263	311	1577	85	83	83	402	0.000	5.67	0.41	7.5	0.197	13.3	13.18	16	8.3	8.4	97.7
138	120	419	322	293	289	263	317	1588	83	83	83	411	0.000	5.44	0.46	6.8	0.970	13.6	13.54	83	7.7	7.7	89.2
143	125	450	335	298	291	263	327	1566	83	83	83	413	0.000	5.22	0.45	6.7	0.997	13.7	13.66	84	7.6	7.6	89.0
148	130	478	352	304	293	263	338	1541	85	83	83	411	0.000	4.94	0.46	6.7	0.845	13.9	13.70	71	7.7	7.7	90.6
153	135	517	365	311	291	265	350	1513	85	83	83	404	0.000	4.76	0.41	7.2	0.221	13.7	13.51	18	8.1	8.2	97.5
158	140	519	372	318	296	265	354	1477	85	85	85	396	0.000	4.54	0.36	8.0	0.080	12.9	12.70	5	8.6	8.7	99.2
163	145	523	378	322	281	266	354	1438	85	85	85	389	0.000	4.35	0.37	8.2	0.081	12.7	12.64	6	8.7	8.8	99.2
168	150	508	381	324	281	266	352	1434	85	85	85	389	0.000	4.17	0.32	8.4	0.083	12.5	12.46	6	8.8	8.9	99.1
173	155	493	383	324	279	266	349	1462	85	85	85	385	0.000	3.99	0.32	8.4	0.074	12.5	12.42	5	8.9	8.9	99.2
178	160	489	383	326	279	268	349	1445	85	85	85	383	0.000	3.81	0.32	8.7	0.063	12.2	12.12	4	9.0	9.1	99.4
183	165	496	387	329	277	266	351	1417	85	85	83	374	0.000	3.63	0.32	9.3	0.056	11.6	11.57	4	9.5	9.5	99.5
188	170	504	390	331	274	266	353	1388	85	83	83	370	0.000	3.49	0.27	9.6	0.060	11.3	11.31	4	9.7	9.7	99.4
193	175	517	392	338	262	266	355	1333	86	83	86	359	0.000	3.36	0.27	10.3	0.075	10.6	10.64	6	10.3	10.2	99.1
198	180	502	390	338	251	266	349	1275	86	83	83	351	0.000	3.22	0.23	10.8	0.077	10.1	9.93	7	10.7	10.9	99.0
203	185	487	385	338	240	264	343	1240	86	86	86	344	0.000	3.13	0.18	11.1	0.071	9.8	9.86	6	11.0	10.9	99.1
208	190	479	381	336	240	266	340	1252	86	86	84	340	0.000	3.04	0.18	11.3	0.097	9.6	9.58	10	11.2	11.2	98.6
213	195	481	377	336	238	264	339	1190	86	84	84	333	0.000	2.90	0.18	11.7	0.098	9.2	9.46	10	11.5	11.3	98.5
218	200	496	373	338	234	264	341	1143	86	86	84	327	0.000	2.81	0.18	12.0	0.147	8.9	8.80	17	11.8	12.0	97.6
223	205	500	370	342	232	262	341	1091	86	84	84	323	0.000	2.72	0.14	11.8	0.557	8.8	8.99	73	11.4	11.4	90.4
228	210	503	364	347	230	262	341	1019	86	84	84	312	0.000	2.63	0.14	12.4	0.708	8.2	8.07	100	12.0	12.2	87.3
233	215	488	360	349	223	262	336	1005	84	84	84	303	0.000	2.49	0.19	12.8	0.514	7.9	7.84	75	12.6	12.7	90.2
238	220	470	353	351	212	260	329	960	84	84	82	295	0.000	2.45	0.14	13.0	0.494	7.6	7.55	74	13.0	13.2	90.3
243	225	457	347	349	199	258	322	922	84	84	84	286	0.000	2.40	0.09	13.7	0.339	7.0	7.06	54	14.1	14.1	92.6
248	230	449	345	347	191	258	318	890	84	84	84	277	0.000	2.36	0.04	13.9	0.330	6.9	6.81	54	14.4	14.5	92.7
253	235	442	340	345	191	256	315	861	84	84	84	271	0.000	2.31	0.09	14.2	0.408	6.5	6.53	71	14.9	14.9	90.6
258	240	436	334	343	187	254	310	842	84	84	82	267	0.000	2.27	0.09	14.3	0.437	6.4	6.43	77	15.0	15.0	89.8
263	245	429	332	338	187	256	308	811	84	82	84	260	0.000	2.27	0.04	14.5	0.545	6.1	6.14	102	15.4	15.4	87.1
268	250	425	325	336	178	254	304	781	84	82	84	256	0.000	2.22	0.05	14.7	0.570	6.0	5.95	110	15.6	15.7	86.2
273	255	418	323	334	172	254	300	754	84	82	84	249	0.000	2.18	0.04	14.9	0.567	5.8	5.80	112	16.0	16.0	86.0
278	260	412	319	330	170	252	296	735	84	82	82	243	0.000	2.13	0.09	15.0	0.572	5.7	5.65	116	16.2	16.3	85.6
283	265	406	314	325	165	252	292	714	84	82	82	239	0.000	2.13	0.05	15.1	0.593	5.5	5.52	124	16.5	16.6	84.8
288	270	401	312	323	163	249	290	693	84	82	82	234	0.000	2.09	0.04	15.1	0.593	5.5	5.45	124	16.6	16.7	84.8
293	275	397	306	321	155	245	285	679	82	82	82	230	0.000	2.04	0.09	15.3	0.590	5.4	5.42	126	16.8	16.8	84.5
298	280	393	304	319	163	245	285	662	82	82	82	226	0.000	2.04	0.05	15.3	0.584	5.3	5.33	126	17.0	17.0	84.6
303	285	388	302	315	159	243	281	645	82	80	82	222	0.000	2.00	0.04	15.5	0.574	5.2	5.20	128	17.4	17.3	84.4
308	290	384	297	310	151	241	277	655	82	82	80	219	0.000	1.95	0.05	15.3	0.643	5.3	5.29	139	16.8	17.0	83.3
313	295	380	295	308	151	239	274	640	82	82	82	217	0.000	1.90	0.10	15.5	0.617	5.1	5.15	138	17.3	17.3	83.3
318	300	375	291	306	140	237	270	630	82	80	80	215	0.000	1.90	0.05	15.6	0.608	5.1	5.03	138	17.6	17.7	83.4
323	305	373	286	304	148	235	269	619	80	80	80	211	0.000	1.81	0.09	15.7	0.609	4.9	5.00	142	17.8	17.7	83.0
328	310	369	284	301	140	232	265	604	80	80	80	208	0.000	1.81	0.09	15.7	0.595	4.9	4.86	139	17.9	18.1	83.3
333	315	367	282	297	153	230	266	591	80	80	80	206	0.000	1.81	0.00	15.9	0.571	4.8	4.77	138	18.4	18.4	83.3
338	320	362	277	295	144	228	261	580	80	80	80	202	0.000	1.77	0.04	16.0	0.559	4.7	4.66	137	18.6	18.8	83.5
343	325	358	275	293	139	225	258	570	80	80	80	200	0.000	1.77	0.00	16.0	0.546	4.6	4.60	135	18.9	19.0	83.7
348	330	355	273	288	133	221	254	559	80	78	80	197	0.000	1.72	0.05	16.1	0.559	4.6	4.56	141	19.0	19.1	83.1
353	335	353	271	286	139	221	254	550	80	78	80	195	0.000	1.68	0.04	16.2	0.542	4.5	4.54	138	19.3	19.2	83.4

Rec #	Tst .ET	Top Tmp F	Rht Avg F	Lft Tmp F	Bak Tmp F	Bot Tmp F	Avg Stove F	Ext1 F	Ext2 F	Ext3 F	Ext4 F	Stk Tmp F	Stk Drft "H2O	Scale kg	10min Drop kg	Stk .O2 %	Stk CO %	Stk CO2 %	Inc CO2 %	CO Fac g/kg	Stk AF	Inc AF	Comb Effic %
358	340	349	266	290	129	219	251	539	80	80	77	193	0.000	1.68	0.00	16.2	0.536	4.5	4.42	137	19.4	19.6	83.4
363	345	346	264	281	141	219	250	535	79	79	79	191	0.000	1.63	0.05	16.2	0.536	4.4	4.40	139	19.5	19.7	83.3
368	350	342	260	279	128	216	245	541	79	79	77	191	0.000	1.63	0.05	16.1	0.560	4.6	4.69	141	19.0	18.7	83.1
373	355	344	257	279	137	212	246	541	79	77	77	190	0.000	1.59	0.04	15.8	0.657	4.8	4.79	159	18.2	18.1	81.4
378	360	344	255	277	130	210	243	539	77	77	77	190	0.000	1.59	0.04	15.9	0.620	4.8	4.72	151	18.3	18.5	82.2
383	365	344	253	275	130	212	243	537	79	77	77	190	0.000	1.54	0.05	16.0	0.585	4.7	4.66	144	18.6	18.7	82.8
388	370	342	251	275	135	208	242	530	77	77	77	190	0.000	1.50	0.09	16.2	0.566	4.5	4.49	146	19.2	19.3	82.6
393	375	340	251	270	137	207	241	524	79	77	77	188	0.000	1.50	0.04	16.3	0.544	4.4	4.39	143	19.7	19.6	82.8
398	380	340	249	270	137	207	240	524	77	77	77	188	0.000	1.45	0.05	16.3	0.541	4.4	4.40	142	19.5	19.6	83.0
403	385	337	246	268	126	205	237	522	77	77	77	186	0.000	1.41	0.09	16.4	0.520	4.3	4.30	139	20.0	20.0	83.3

Rec #	Tst .ET	Top Tmp F	Rht Avg F	Lft Tmp F	Bak Tmp F	Bot Tmp F	Avg Stove F	Ext1 F	Ext2 F	Ext3 F	Ext4 F	Stk Tmp F	Stk Drft "H2O	Scale kg	10min Drop kg	Stk .O2 %	Stk CO %	Stk CO2 %	Inc CO2 %	CO Fac g/kg	Stk AF	Inc AF	Comb Effic %

* Real time data is presented at 5 minute intervals. Average values appearing in this report are based on more frequent measurements

Notes:

Results Table = HHT
Filename = DauntCatCord1909192
Test Stand A
ASTM beech, Low

Stove Name: DauntCatCord Test Date: 9/20/2019 Run #: 1 File: DauntCatCord19 Record # Start 7 Stop 138

Test Time	131	min
Wet Wood	7.82	kg
Moisture	20.5	dry %
Dry Wood	6.49	kg
Coal Bed	1.18	kg
Stove DeltaT	327	deg F
Tunnel CD	0.933	

Avg Stack Gasses (amb Corrected)

CO	0.416	%
CO2	12.61	%
O2	7.97	%
HC	n/m	% as CH4
TCC	0.83	% as CO2

Results

Real Time Data*

Rec #	Tst .ET	Top Tmp F	Rht Avg F	Lft Tmp F	Bak Tmp F	Bot Tmp F	Avg Stove F	Ext1 F	Ext2 F	Ext3 F	Ext4 F	Stk Tmp F	Stk Drft "H2O	Scale kg	10min Drop kg	Stk .O2 %	Stk CO %	Stk CO2 %	Inc CO2 %	CO Fac g/kg	Stk AF	Inc AF	Comb Effic %
0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	0.00	0.00	0.0	0.000	0.0	0.00	0	0.0	0.0	0.0
5	5	73	71	73	76	76	74	73	71	71	73	73	0.000	1.50	-1.50	20.9	0.011	0.0	0.07	0	90.8	88.2	100.0
7	0	76	71	74	69	74	73	74	74	74	71	74	0.000	1.50	-1.50	20.9	0.012	0.0	0.07	0	90.0	88.2	0.0
12	5	144	76	80	74	76	90	76	74	74	74	269	0.000	1.32	14.28	17.6	0.133	3.3	3.75	43	25.8	23.7	94.1
17	10	284	93	112	87	74	130	85	74	74	72	542	0.000	0.95	0.50	11.3	0.294	9.5	7.57	35	11.0	13.5	95.1
22	15	450	134	174	117	76	190	115	74	74	74	566	0.000	0.50	0.82	8.0	0.667	12.6	12.43	61	8.4	8.6	91.7
27	20	417	151	192	121	89	194	1150	74	76	74	343	0.000	2.45	-1.59	13.4	0.342	7.4	3.99	52	13.5	21.6	92.9
32	25	354	155	192	160	104	193	1404	76	76	74	422	0.000	2.13	-1.68	8.2	0.140	12.6	12.84	11	8.7	8.6	98.3
37	30	324	162	196	190	123	199	1440	77	77	75	435	0.000	1.77	0.63	9.3	0.351	11.5	11.89	35	9.3	9.2	95.1
42	35	329	169	203	214	145	212	1287	77	77	77	452	0.000	1.45	0.59	7.7	0.068	13.2	12.36	4	8.4	8.9	99.4
47	40	337	184	212	223	164	224	1321	77	77	77	453	0.000	1.18	0.54	10.2	0.373	10.6	10.38	40	10.0	10.1	94.4
52	45	323	197	216	225	186	229	1529	77	77	77	487	0.000	8.62	-7.21	6.1	1.241	14.3	14.22	102	7.3	7.4	87.1
57	50	318	204	227	247	201	239	1572	79	77	77	492	0.000	8.30	0.68	7.2	0.102	13.6	13.04	7	8.2	8.5	98.9
62	55	323	206	240	262	217	250	1659	80	77	77	522	0.000	7.85	0.68	5.8	0.249	15.0	15.09	18	7.4	7.0	97.4
67	60	323	206	251	286	234	260	1666	80	80	80	527	0.000	7.44	0.77	5.4	0.493	15.3	15.03	37	7.2	7.2	94.8
72	65	334	210	262	286	249	268	1672	80	80	80	533	0.000	6.94	0.82	4.8	2.016	15.1	15.20	157	6.7	6.7	81.6
77	70	354	217	269	304	267	282	1712	82	80	80	542	0.000	6.53	0.77	4.7	1.663	15.4	15.41	127	6.7	6.8	84.5
82	75	363	226	276	308	280	291	1717	82	80	80	546	0.000	6.12	0.77	4.9	0.685	15.7	15.63	51	6.9	6.9	93.1
87	80	376	233	285	315	295	301	1724	82	80	80	536	0.000	5.62	0.82	5.3	0.503	15.4	15.61	37	7.1	6.7	94.8
92	85	395	241	296	313	304	310	1649	83	81	81	527	0.000	5.22	0.77	5.3	0.448	15.4	14.79	33	7.2	7.6	95.4
97	90	428	255	315	315	313	325	1577	83	83	83	510	0.000	4.81	0.77	7.3	0.054	13.6	14.09	3	8.2	8.0	99.6
102	95	482	270	348	296	320	343	1449	83	81	83	502	0.000	4.40	0.72	7.5	0.323	13.3	12.79	27	8.2	8.5	96.1
107	100	545	287	374	289	320	363	1260	83	83	83	500	0.000	3.99	0.73	7.3	2.016	12.7	14.82	188	7.7	6.8	78.8
112	105	547	311	387	292	322	372	1593	83	83	83	509	0.000	3.58	0.82	6.5	0.091	14.4	14.77	6	7.8	7.5	99.1
117	110	545	329	392	279	318	372	1610	83	83	83	509	0.000	3.22	0.68	6.2	0.112	14.7	13.85	8	7.6	8.1	98.9

Rec #	Tst .ET	Top Tmp F	Rht Avg F	Lft Tmp F	Bak Tmp F	Bot Tmp F	Avg Stove F	Ext1 F	Ext2 F	Ext3 F	Ext4 F	Stk Tmp F	Stk Drft "H2O	Scale kg	10min Drop kg	Stk .O2 %	Stk CO %	Stk CO2 %	Inc CO2 %	CO Fac g/kg	Stk AF	Inc AF	Comb Effic %
122	115	578	351	394	279	316	383	1632	84	84	84	524	0.000	2.86	0.68	5.9	0.136	15.0	15.47	9	7.5	7.2	98.6
127	120	612	368	407	286	312	397	1574	86	84	84	522	0.000	2.54	0.63	5.7	0.203	15.1	15.14	14	7.4	7.3	97.9
132	125	619	375	427	284	310	403	1561	84	84	84	509	0.000	2.22	0.59	6.9	0.063	14.0	14.23	4	8.0	7.9	99.5
137	130	604	379	440	273	308	401	1380	86	84	84	479	0.000	2.00	0.45	10.4	0.057	10.5	11.01	4	10.3	10.0	99.4
138	131	602	377	440	266	308	399	1361	86	84	84	473	0.000	1.95	0.45	10.4	0.057	10.5	10.27	4	10.3	10.6	99.4

Rec #	Tst .ET	Top Tmp F	Rht Avg F	Lft Tmp F	Bak Tmp F	Bot Tmp F	Avg Stove F	Ext1 F	Ext2 F	Ext3 F	Ext4 F	Stk Tmp F	Stk Drft "H2O	Scale kg	10min Drop kg	Stk .O2 %	Stk CO %	Stk CO2 %	Inc CO2 %	CO Fac g/kg	Stk AF	Inc AF	Comb Effic %

* Real time data is presented at 5 minute intervals. Average values appearing in this report are based on more frequent measurements

Notes:

Results Table = HHT
Filename = DauntCatCord1909201
Test Stand A
ASTM beech, Hi

Stove Name: DauntCatCord Test Date: 9/20/2019 Run #: 2 File: DauntCatCord19 Record # Start 47 Stop 700

Test Time	653	min
Wet Wood	10.09	kg
Moisture	20.5	dry %
Dry Wood	8.37	kg
Coal Bed	1.27	kg
Stove DeltaT	-147	deg F
Tunnel CD	0.933	

Avg Stack Gasses (amb Corrected)

CO	0.237	%
CO2	2.57	%
O2	18.19	%
HC	n/m	% as CH4
TCC	0.48	% as CO2

Results

Real Time Data*

Rec #	Tst .ET	Top Tmp F	Rht Avg F	Lft Tmp F	Bak Tmp F	Bot Tmp F	Avg Stove F	Ext1 F	Ext2 F	Ext3 F	Ext4 F	Stk Tmp F	Stk Drft "H2O	Scale kg	10min Drop kg	Stk .O2 %	Stk CO %	Stk CO2 %	Inc CO2 %	CO Fac g/kg	Stk AF	Inc AF	Comb Effic %
0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	0.00	0.00	0.0	0.000	0.0	0.00	0	0.0	0.0	0.0
5	5	508	360	412	230	310	364	1288	84	84	84	332	0.000	1.63	0.50	15.7	0.238	5.2	6.69	51	18.4	14.5	93.1
10	10	491	358	397	226	310	357	1211	85	85	85	323	0.000	1.54	0.18	11.2	0.088	9.7	8.93	8	11.1	11.9	98.8
15	15	478	356	387	213	306	348	1139	85	85	85	308	0.000	1.45	0.14	13.3	0.114	7.6	7.93	15	13.6	13.1	97.9
20	20	471	348	378	215	300	342	1072	85	83	85	298	0.000	1.45	0.05	13.6	0.159	7.2	6.98	23	14.1	14.5	96.7
25	25	461	343	370	207	296	335	1010	85	83	85	289	0.000	1.41	0.04	14.2	0.250	6.6	6.70	42	15.1	14.9	94.2
30	30	452	339	361	198	289	328	967	85	83	83	281	0.000	1.36	0.05	14.6	0.334	6.1	6.13	61	15.8	15.8	91.7
35	35	441	335	355	188	283	320	889	85	83	83	270	0.000	1.36	0.05	15.4	0.503	5.3	5.45	110	17.3	17.0	86.3
40	40	429	329	344	173	279	311	822	83	83	83	259	0.000	1.32	0.04	15.8	0.579	4.9	4.82	137	18.1	18.3	83.5
45	45	418	322	335	173	272	304	775	83	83	83	251	0.000	1.32	0.00	16.0	0.576	4.6	4.68	144	18.9	18.7	82.8
47	0	407	320	331	171	268	299	843	83	83	83	251	0.000	1.27	0.05	16.6	0.609	4.1	4.58	174	20.5	19.0	80.1
52	5	349	309	318	158	266	280	1101	84	84	84	279	0.000	11.25	-9.93	13.2	0.640	7.4	7.79	100	13.1	12.7	87.3
57	10	307	294	301	165	260	265	1178	84	84	84	301	0.000	11.07	0.31	12.2	0.547	8.4	8.27	74	11.9	12.0	90.2
62	15	282	275	284	174	253	254	1228	84	84	84	316	0.000	10.88	0.32	11.9	0.292	8.8	8.84	36	11.7	11.8	94.9
67	20	264	262	271	189	251	247	1248	84	84	84	329	0.000	10.70	0.32	11.7	0.234	9.1	8.96	28	11.6	11.8	96.0
72	25	251	249	258	191	247	239	1309	84	82	84	342	0.000	10.48	0.36	10.9	0.174	9.9	10.06	18	10.8	10.7	97.4
77	30	245	241	252	198	243	236	1338	84	84	84	351	0.000	10.25	0.36	10.6	0.238	10.2	10.07	25	10.4	10.6	96.5
82	35	245	232	247	202	236	233	1211	84	84	84	351	0.000	10.02	0.41	10.3	0.502	10.4	9.45	55	10.1	10.8	92.5
87	40	252	226	252	187	237	231	1153	84	84	84	338	0.000	9.80	0.40	12.1	0.824	8.4	8.30	113	11.6	11.7	85.9
92	45	254	222	258	207	235	235	1158	85	82	82	339	0.000	9.52	0.41	11.9	0.763	8.7	8.75	101	11.4	11.4	87.1
97	50	258	217	267	202	235	236	1191	85	85	85	343	0.000	9.34	0.37	11.3	0.596	9.4	9.17	73	10.9	11.1	90.4
102	55	272	218	269	207	233	240	1164	85	83	85	352	0.000	9.07	0.41	10.5	0.723	10.1	10.22	83	10.1	10.0	89.2
107	60	283	218	285	226	231	248	1235	85	85	85	361	0.000	8.84	0.46	9.7	0.818	10.8	10.78	87	9.5	9.5	88.7
112	65	298	218	300	224	233	255	1295	85	83	85	372	0.000	8.53	0.49	9.3	0.907	11.1	11.59	95	9.2	8.9	87.9
117	70	311	218	313	224	233	260	1123	85	83	85	357	0.000	8.25	0.50	10.8	0.885	9.7	10.05	106	10.3	10.1	86.7

Rec #	Tst .ET	Top Tmp F	Rht Avg F	Lft Tmp F	Bak Tmp F	Bot Tmp F	Avg Stove F	Ext1 F	Ext2 F	Ext3 F	Ext4 F	Stk Tmp F	Stk Drft "H2O	Scale kg	10min Drop kg	Stk .O2 %	Stk CO %	Stk CO2 %	Inc CO2 %	CO Fac g/kg	Stk AF	Inc AF	Comb Effic %
122	75	326	220	328	231	233	268	1043	85	85	85	341	0.000	8.03	0.45	11.2	0.987	9.2	9.02	124	10.6	10.8	84.7
127	80	339	222	342	220	233	271	971	85	85	85	331	0.000	7.80	0.41	12.0	1.005	8.4	8.55	139	11.4	11.3	83.2
132	85	350	225	355	203	233	273	949	85	85	85	320	0.000	7.57	0.41	12.1	1.014	8.3	8.30	143	11.6	11.6	82.9
137	90	353	225	359	210	231	275	980	85	85	85	320	0.000	7.39	0.37	11.8	0.994	8.7	8.54	134	11.2	11.3	83.8
142	95	357	227	363	207	233	278	938	85	85	85	313	0.000	7.17	0.36	12.0	1.039	8.5	8.45	143	11.3	11.4	82.9
147	100	361	229	370	197	233	278	924	86	83	86	309	0.000	6.98	0.37	11.9	1.001	8.5	8.58	136	11.3	11.2	83.5
152	105	368	231	377	188	233	279	903	86	83	86	305	0.000	6.80	0.37	11.6	1.126	8.8	8.60	150	11.0	11.1	82.2
157	110	377	234	385	195	234	285	868	86	86	86	298	0.000	6.58	0.40	11.9	1.105	8.5	8.51	151	11.2	11.2	82.1
162	115	381	236	394	188	231	286	808	86	86	86	288	0.000	6.39	0.37	12.2	1.159	8.2	7.84	166	11.6	11.9	80.7
167	120	390	238	399	182	234	288	748	86	86	84	277	0.000	6.21	0.37	13.1	1.199	7.3	7.34	192	12.5	12.5	78.5
172	125	396	238	405	176	232	289	686	86	86	84	266	0.000	6.03	0.32	13.3	1.110	7.0	6.89	184	13.0	13.2	79.2
177	130	401	238	410	180	232	292	748	86	84	86	260	0.000	5.85	0.32	13.3	1.115	7.1	6.98	184	12.9	13.0	79.1
182	135	377	238	401	169	232	283	1069	86	84	86	301	0.000	5.67	0.32	11.7	0.655	8.9	9.13	84	11.3	11.1	89.1
187	140	377	236	390	180	232	283	964	86	84	86	308	0.000	5.49	0.36	11.7	0.922	8.8	9.69	122	11.1	10.6	85.0
192	145	392	236	388	193	232	288	890	86	84	84	290	0.000	5.31	0.31	12.6	0.875	7.9	7.70	129	12.2	12.4	84.3
197	150	403	236	392	184	230	289	758	86	86	84	273	0.000	5.22	0.27	13.7	1.000	6.7	6.87	173	13.5	13.4	80.1
202	155	403	240	390	187	228	290	714	86	84	84	258	0.000	5.03	0.28	14.0	0.973	6.4	6.34	175	14.1	14.3	79.9
207	160	395	240	386	165	228	283	783	84	84	84	260	0.000	4.90	0.27	13.9	0.925	6.6	5.99	163	13.9	14.8	81.0
212	165	392	243	375	165	228	281	668	86	84	84	251	0.000	4.76	0.27	14.1	1.082	6.3	5.90	201	14.2	14.8	77.7
217	170	382	241	366	163	228	276	621	84	84	84	241	0.000	4.63	0.27	15.1	1.073	5.3	5.38	235	15.9	15.8	75.0
222	175	369	241	360	165	228	272	595	84	84	84	230	0.000	4.49	0.23	15.2	1.037	5.2	5.22	232	16.2	16.2	75.2
227	180	360	238	351	157	228	267	576	84	84	84	223	0.000	4.40	0.18	15.2	1.069	5.2	5.16	240	16.2	16.3	74.6
232	185	360	238	347	150	226	264	563	84	84	84	219	0.000	4.26	0.23	15.1	1.083	5.3	5.32	236	15.8	15.9	74.9
237	190	364	239	340	155	223	264	553	84	84	84	215	0.000	4.13	0.22	15.1	0.595	5.5	5.50	122	16.5	15.5	84.9
242	195	366	238	336	150	223	263	542	84	82	82	208	0.000	3.99	0.27	16.8	0.081	4.1	5.51	14	22.5	15.5	97.9
247	200	369	241	330	140	223	260	537	84	84	84	206	0.000	3.90	0.23	20.7	0.026	0.3	5.47	-30	78.7	15.8	95.8
252	205	364	241	325	142	221	259	529	84	82	84	202	0.000	3.81	0.18	20.8	0.026	0.1	4.31	0	88.4	21.8	0.0
257	210	358	241	319	135	221	255	531	84	84	82	202	0.000	3.67	0.18	20.9	0.025	0.1	1.15	0	89.8	50.3	0.0
262	215	358	240	314	135	219	253	533	82	80	82	199	0.000	3.54	0.22	20.9	0.026	0.1	0.13	0	89.7	86.3	0.0
267	220	362	245	312	144	217	256	542	84	82	82	197	0.000	3.45	0.18	20.9	0.025	0.1	0.12	0	90.5	87.5	0.0
272	225	364	245	310	133	217	254	583	84	82	82	200	0.000	3.31	0.23	20.9	0.025	0.0	0.08	0	90.5	89.5	0.0
277	230	364	245	305	135	217	253	557	82	82	82	199	0.000	3.27	0.13	20.9	0.026	0.0	0.07	0	90.5	90.1	0.0
282	235	377	245	305	139	217	257	555	82	82	82	202	0.000	3.17	0.14	20.9	0.022	0.0	0.07	0	90.7	90.1	0.0
287	240	384	245	305	139	215	258	561	82	82	82	202	0.000	3.08	0.14	20.9	0.025	0.0	0.07	0	90.5	90.8	0.0
292	245	381	247	303	137	215	257	561	82	84	82	199	0.000	2.99	0.18	20.9	0.023	0.0	0.06	0	90.7	90.8	0.0
297	250	377	249	301	131	214	254	561	82	82	82	199	0.000	2.90	0.18	20.9	0.023	0.0	0.05	0	90.7	91.5	0.0
302	255	368	251	299	135	212	253	556	82	82	82	197	0.000	2.86	0.13	20.9	0.024	0.0	0.04	0	90.6	92.2	0.0
307	260	364	251	294	141	214	253	552	82	82	82	195	0.000	2.86	0.04	20.9	0.024	0.0	0.04	0	89.9	91.5	0.0
312	265	362	253	290	137	214	251	550	82	79	79	195	0.000	2.77	0.09	20.9	0.022	0.0	0.03	0	90.7	92.2	0.0
317	270	359	253	288	128	214	249	559	82	82	82	195	0.000	2.72	0.09	20.9	0.023	0.0	0.04	0	90.7	92.2	0.0
322	275	357	257	283	133	214	249	563	81	81	79	193	0.000	2.68	0.09	20.9	0.023	0.0	0.03	0	90.7	92.2	0.0
327	280	355	259	281	124	214	247	567	81	79	79	193	0.000	2.68	0.04	20.9	0.022	0.0	0.04	0	90.7	92.2	0.0
332	285	351	264	279	128	212	247	563	79	79	79	192	0.000	2.63	0.05	20.9	0.022	0.0	0.04	0	90.7	92.2	0.0
337	290	350	268	274	124	214	246	563	81	79	79	192	0.000	2.59	0.09	20.9	0.022	0.0	0.05	0	90.7	91.4	0.0
342	295	348	272	272	134	214	248	562	81	79	79	190	0.000	2.59	0.04	20.9	0.023	0.0	0.07	0	90.7	90.1	100.0
347	300	346	277	270	128	214	247	560	81	79	79	190	0.000	2.54	0.05	20.9	0.023	0.0	0.08	0	90.7	89.5	0.0
352	305	344	278	268	130	214	247	569	81	79	79	190	0.000	2.49	0.10	20.9	0.023	0.0	0.10	0	90.7	88.2	0.0

Rec #	Tst .ET	Top Tmp F	Rht Avg F	Lft Tmp F	Bak Tmp F	Bot Tmp F	Avg Stove F	Ext1 F	Ext2 F	Ext3 F	Ext4 F	Stk Tmp F	Stk Drft "H2O	Scale kg	10min Drop kg	Stk .O2 %	Stk CO %	Stk CO2 %	Inc CO2 %	CO Fac g/kg	Stk AF	Inc AF	Comb Effic %
357	310	344	281	265	138	214	248	569	81	79	79	192	0.000	2.49	0.05	20.9	0.023	0.0	0.15	0	90.7	84.5	100.0
362	315	344	281	263	132	214	247	571	81	79	79	192	0.000	2.45	0.04	20.9	0.021	0.0	0.41	0	90.8	72.0	0.0
367	320	341	283	263	136	213	247	571	79	79	79	192	0.000	2.40	0.05	20.9	0.022	0.0	0.82	0	90.7	58.2	0.0
372	325	343	285	261	127	213	246	568	78	78	78	190	0.000	2.36	0.09	20.9	0.022	0.1	1.24	0	90.7	48.5	0.0
377	330	341	282	261	129	213	245	568	78	78	78	189	0.000	2.36	0.04	20.9	0.019	0.1	1.82	0	90.2	39.4	0.0
382	335	338	284	260	133	213	246	561	78	78	78	189	0.000	2.31	0.09	20.9	0.022	0.1	2.35	0	90.0	33.5	0.0
387	340	341	284	256	133	213	245	557	78	78	78	187	0.000	2.31	0.05	20.9	0.022	0.1	2.72	0	90.7	30.5	0.0
392	345	338	284	256	131	213	244	555	78	78	78	187	0.000	2.27	0.04	20.9	0.021	0.1	3.44	0	89.4	25.8	0.0
397	350	336	284	256	131	210	243	552	78	78	78	184	0.000	2.22	0.09	20.9	0.020	0.1	3.59	0	90.1	25.0	0.0
402	355	332	282	253	133	212	242	548	78	78	78	184	0.000	2.22	0.05	20.9	0.020	0.1	3.97	0	89.5	23.2	0.0
407	360	331	281	251	131	210	241	546	77	77	77	182	0.000	2.18	0.04	20.9	0.020	0.1	4.14	0	90.1	22.3	0.0
412	365	329	279	255	135	208	241	541	77	77	77	182	0.000	2.18	0.04	20.9	0.020	0.1	4.25	0	89.5	21.8	0.0
417	370	329	279	246	130	208	238	535	77	75	77	182	0.000	2.13	0.05	20.9	0.020	0.1	4.23	0	88.8	21.9	0.0
422	375	324	279	246	128	207	237	526	77	77	75	182	0.000	2.09	0.09	20.9	0.019	0.1	4.26	0	88.9	21.5	0.0
427	380	322	276	244	128	205	235	543	77	77	77	181	0.000	2.09	0.04	20.9	0.019	0.1	4.22	0	88.9	21.7	0.0
432	385	324	276	242	128	203	234	536	77	77	74	181	0.000	2.09	0.04	20.9	0.019	0.1	4.48	0	89.5	20.5	0.0
437	390	326	274	241	121	205	233	532	76	76	76	181	0.000	2.04	0.05	20.9	0.019	0.1	4.39	0	88.9	20.8	0.0
442	395	324	274	239	127	202	233	527	76	76	76	181	0.000	2.00	0.04	20.9	0.020	0.1	4.35	0	90.8	20.9	0.0
447	400	326	274	239	119	200	231	523	76	76	76	181	0.000	2.00	0.04	20.9	0.020	0.1	4.32	0	89.5	20.9	0.0
452	405	326	271	237	119	200	230	519	76	76	74	179	0.000	1.95	0.05	20.9	0.019	0.1	4.27	0	89.5	21.0	0.0
457	410	325	271	234	129	200	232	508	76	74	76	176	0.000	1.95	0.05	20.9	0.019	0.1	4.18	0	89.5	21.2	0.0
462	415	323	269	234	127	198	230	499	76	74	76	176	0.000	1.95	0.00	20.9	0.020	0.1	4.05	0	89.5	21.5	0.0
467	420	321	266	234	122	197	228	486	75	73	73	174	0.000	1.90	0.05	20.9	0.017	0.1	3.96	0	89.6	21.9	0.0
472	425	320	266	229	116	195	225	479	75	75	73	171	0.000	1.86	0.04	20.9	0.017	0.1	3.86	0	90.3	22.3	0.0
477	430	316	262	227	126	193	225	470	75	73	75	169	0.000	1.86	0.04	20.9	0.018	0.1	3.82	0	88.9	22.4	0.0
482	435	316	262	225	122	193	223	463	75	73	75	169	0.000	1.81	0.05	20.9	0.018	0.1	3.76	0	90.2	22.6	0.0
487	440	314	259	225	124	190	222	457	75	73	75	167	0.000	1.81	0.05	20.9	0.019	0.1	3.77	0	89.5	22.5	0.0
492	445	311	257	223	117	190	220	453	75	75	75	165	0.000	1.81	0.00	20.9	0.016	0.1	3.71	0	89.1	22.7	0.0
497	450	309	255	220	119	190	219	450	75	73	73	164	0.000	1.81	0.05	20.9	0.019	0.1	3.75	0	89.5	22.5	0.0
502	455	309	253	218	111	188	216	444	75	75	75	162	0.000	1.77	0.04	20.9	0.018	0.1	3.75	0	88.9	22.5	0.0
507	460	305	250	218	113	188	215	437	74	74	74	160	0.000	1.77	0.04	20.8	0.018	0.1	3.67	0	87.0	22.9	0.0
512	465	302	248	216	108	188	212	433	74	74	72	160	0.000	1.77	0.04	20.8	0.017	0.1	3.60	0	88.3	23.2	0.0
517	470	300	246	213	117	185	212	428	74	74	74	157	0.000	1.72	0.05	20.8	0.018	0.1	3.56	-15	85.8	23.4	0.0
522	475	298	246	211	121	185	212	417	74	74	72	157	0.000	1.72	0.05	20.8	0.018	0.1	3.39	-59	85.8	24.2	0.0
527	480	293	241	209	117	183	209	419	74	72	72	155	0.000	1.72	0.00	20.8	0.017	0.2	3.35	-45	82.9	24.4	93.8
532	485	289	239	209	119	183	208	417	74	72	74	153	0.000	1.68	0.04	20.8	0.019	0.2	3.35	-10	83.4	24.3	98.6
537	490	287	237	207	110	183	205	410	74	72	74	153	0.000	1.68	0.00	20.7	0.018	0.2	3.30	-15	81.3	24.5	97.9
542	495	282	232	206	118	180	204	408	74	72	72	153	0.000	1.63	0.05	20.7	0.016	0.2	3.23	-23	78.7	24.9	96.8
547	500	278	230	202	103	180	199	406	74	72	74	150	0.000	1.63	0.05	20.7	0.017	0.3	3.18	-21	77.6	25.2	97.1
552	505	275	228	200	114	178	199	399	74	74	71	150	0.000	1.63	0.00	20.6	0.018	0.3	3.14	-8	75.2	25.4	98.8
557	510	273	223	200	116	176	198	395	74	74	74	148	0.000	1.59	0.04	20.6	0.019	0.3	3.11	0	75.2	25.6	100.0
562	515	271	221	197	107	176	194	395	73	71	71	148	0.000	1.59	0.04	20.5	0.018	0.4	3.06	-10	71.2	25.9	98.6
567	520	269	219	195	105	176	193	392	73	71	73	146	0.000	1.59	0.00	20.5	0.018	0.4	3.14	-9	70.0	25.3	98.7
572	525	266	219	193	112	174	193	390	73	73	73	146	0.000	1.54	0.05	20.5	0.017	0.5	3.11	-8	68.9	25.6	98.8
577	530	264	214	193	111	174	191	386	73	71	73	144	0.000	1.54	0.05	20.3	0.015	0.6	3.05	-13	64.2	25.9	98.2
582	535	262	214	191	103	173	189	379	73	73	73	143	0.000	1.54	0.00	20.3	0.016	0.6	3.01	-6	62.9	26.2	99.1
587	540	260	212	188	107	173	188	377	73	73	73	141	0.000	1.50	0.04	20.3	0.016	0.7	2.97	-7	61.6	26.4	98.9

Rec #	Tst .ET	Top Tmp F	Rht Avg F	Lft Tmp F	Bak Tmp F	Bot Tmp F	Avg Stove F	Ext1 F	Ext2 F	Ext3 F	Ext4 F	Stk Tmp F	Stk Drft "H2O	Scale kg	10min Drop kg	Stk .O2 %	Stk CO %	Stk CO2 %	Inc CO2 %	CO Fac g/kg	Stk AF	Inc AF	Comb Effic %
592	545	260	210	188	105	173	187	370	73	73	73	139	0.000	1.50	0.04	20.2	0.017	0.7	2.92	-3	59.5	26.7	99.5
597	550	257	210	186	111	171	187	366	73	73	73	139	0.000	1.50	0.04	20.2	0.015	0.7	2.86	-7	59.8	27.2	99.0
602	555	255	205	184	105	173	184	361	73	73	73	137	0.000	1.50	0.00	20.2	0.016	0.8	2.80	-2	58.9	27.5	99.8
607	560	251	205	182	111	171	184	359	73	73	73	137	0.000	1.45	0.05	20.1	0.016	0.8	2.79	-7	56.5	27.6	98.9
612	565	248	203	181	111	169	182	352	72	72	72	134	0.000	1.45	0.05	20.1	0.017	0.9	2.75	-3	55.9	27.8	99.6
617	570	248	201	179	109	171	182	350	72	72	72	134	0.000	1.45	0.00	20.1	0.017	0.9	2.72	-4	55.9	28.0	99.4
622	575	246	199	179	98	169	178	346	72	72	72	132	0.000	1.41	0.04	20.0	0.016	0.9	2.67	-7	55.7	28.4	99.0
627	580	244	199	177	98	166	177	339	72	72	72	132	0.000	1.41	0.00	20.0	0.018	0.9	2.64	-3	54.2	28.6	99.6
632	585	237	196	175	100	166	175	331	72	72	72	130	0.000	1.41	0.00	20.0	0.017	0.9	2.40	-3	55.6	30.4	99.6
637	590	235	194	175	106	166	175	324	72	72	72	130	0.000	1.41	0.04	20.1	0.017	0.9	2.29	-1	56.4	31.2	99.8
642	595	231	190	173	104	166	173	317	72	72	72	128	0.000	1.41	0.00	20.0	0.017	0.9	2.23	-1	55.4	31.7	99.8
647	600	226	190	173	96	164	170	311	72	72	72	125	0.000	1.36	0.05	20.0	0.017	0.9	2.20	-4	55.1	32.0	99.4
652	605	222	188	168	104	164	169	304	72	72	72	123	0.000	1.36	0.00	20.0	0.016	0.9	2.13	-5	55.2	32.6	99.2
657	610	218	185	166	89	162	164	302	72	72	72	123	0.000	1.36	0.00	19.9	0.017	1.0	2.11	0	52.8	32.8	100.0
662	615	215	183	164	102	161	165	295	72	72	72	121	0.000	1.36	0.00	20.0	0.017	1.0	2.11	-1	53.7	32.8	99.8
667	620	213	181	161	102	159	163	293	74	72	72	121	0.000	1.32	0.04	19.9	0.016	1.0	2.09	-5	52.3	33.0	99.3
672	625	211	179	161	87	159	159	287	72	72	72	119	0.000	1.32	0.04	19.9	0.017	1.0	2.03	-3	53.2	33.6	99.6
677	630	209	176	161	87	159	158	291	72	72	72	116	0.000	1.32	0.04	19.9	0.014	1.0	2.00	-5	52.6	33.9	99.3
682	635	204	174	157	99	157	158	291	72	72	72	118	0.000	1.32	0.00	19.9	0.015	1.0	1.95	-5	53.0	34.4	99.3
687	640	200	172	155	101	157	157	291	71	71	71	116	0.000	1.32	0.00	19.9	0.015	1.0	1.97	-1	52.1	34.1	99.8
692	645	198	170	153	89	155	153	286	72	72	72	114	0.000	1.32	0.00	19.8	0.016	1.1	1.94	-2	50.6	34.5	99.7
697	650	193	168	150	88	152	150	280	71	71	71	114	0.000	1.32	0.00	19.9	0.018	1.1	1.91	-1	51.2	34.8	99.8
700	653	193	168	150	95	155	152	280	71	71	71	114	0.000	1.27	0.05	19.8	0.016	1.1	1.91	-2	49.8	34.7	99.7

Rec #	Tst .ET	Top Tmp F	Rht Avg F	Lft Tmp F	Bak Tmp F	Bot Tmp F	Avg Stove F	Ext1 F	Ext2 F	Ext3 F	Ext4 F	Stk Tmp F	Stk Drft "H2O	Scale kg	10min Drop kg	Stk .O2 %	Stk CO %	Stk CO2 %	Inc CO2 %	CO Fac g/kg	Stk AF	Inc AF	Comb Effic %

* Real time data is presented at 5 minute intervals. Average values appearing in this report are based on more frequent measurements

Notes:

Results Table = HHT
Filename = DauntCatCord1909202
Test Stand A
ASTM, beech, Low

Stove Name: DauntCatCord Test Date: 9/21/2019 Run #: 1 File: DauntCatCord19 Record # Start 2 Stop 153

Test Time	151	min
Wet Wood	8.42	kg
Moisture	21	dry %
Dry Wood	6.96	kg
Coal Bed	1.32	kg
Stove DeltaT	328	deg F
Tunnel CD	0.933	

Avg Stack Gasses (amb Corrected)

CO	0.596	%
CO2	12.46	%
O2	8.04	%
HC	n/m	% as CH4
TCC	1.19	% as CO2

Results

Real Time Data*

Rec #	Tst .ET	Top Tmp F	Rht Avg F	Lft Tmp F	Bak Tmp F	Bot Tmp F	Avg Stove F	Ext1 F	Ext2 F	Ext3 F	Ext4 F	Stk Tmp F	Stk Drft "H2O	Scale kg	10min Drop kg	Stk .O2 %	Stk CO %	Stk CO2 %	Inc CO2 %	CO Fac g/kg	Stk AF	Inc AF	Comb Effic %
0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	0.00	0.00	0.0	0.000	0.0	0.00	0	0.0	0.0	0.0
2	0	82	80	80	80	82	81	80	76	76	76	78	0.000	1.54	-1.54	20.9	0.020	0.1	0.05	0	88.2	90.1	0.0
7	5	112	83	83	78	83	88	80	76	76	76	166	0.000	1.54	-1.54	18.7	0.073	2.2	2.38	32	34.2	32.6	95.5
12	10	209	89	98	87	83	113	85	76	76	76	383	0.000	1.32	0.27	15.1	0.161	5.7	6.43	29	17.0	15.5	95.8
17	15	346	108	138	106	81	156	98	77	79	77	584	0.000	0.91	0.59	9.8	0.322	10.9	9.66	33	9.7	10.9	95.4
22	20	431	134	184	121	85	191	126	79	79	79	517	0.000	0.54	0.73	11.2	0.260	9.7	9.10	29	10.9	11.6	95.9
27	25	370	145	192	124	94	185	1241	79	79	79	405	0.000	2.68	-1.86	6.8	2.016	13.1	8.63	181	7.4	11.4	79.4
32	30	335	152	199	162	107	191	1275	79	79	79	457	0.000	2.36	0.59	6.9	0.477	13.8	12.85	39	7.9	8.4	94.5
37	35	331	158	206	197	124	203	1382	79	79	79	457	0.000	2.00	0.59	7.6	0.127	13.3	12.36	9	8.3	8.7	98.6
42	40	353	165	214	219	141	219	1327	80	80	80	466	0.000	1.68	0.59	8.9	0.086	12.0	12.25	7	9.2	9.0	99.0
47	45	377	178	228	230	159	234	1514	82	80	80	477	0.000	1.27	0.68	7.4	0.057	13.5	14.10	3	8.2	7.9	99.5
52	50	336	187	230	239	176	233	1570	82	80	80	477	0.000	9.30	-7.71	5.6	2.016	14.4	14.09	165	6.9	7.1	80.8
57	55	319	189	226	243	193	234	1506	82	82	82	490	0.000	8.80	0.86	5.9	2.016	14.0	14.15	168	7.1	7.0	80.5
62	60	306	196	226	250	209	237	1538	82	82	82	490	0.000	8.30	0.91	6.0	2.016	13.9	14.19	169	7.1	7.0	80.5
67	65	306	211	226	272	224	248	1584	83	83	83	501	0.000	7.80	0.91	5.2	2.016	14.8	14.47	160	6.8	6.9	81.3
72	70	311	228	226	272	235	254	1618	83	83	83	508	0.000	7.39	0.82	4.9	1.895	15.1	15.13	148	6.7	6.8	82.4
77	75	328	252	231	278	250	268	1638	85	83	83	517	0.000	6.94	0.77	4.9	1.246	15.4	15.41	94	6.8	6.9	87.9
82	80	357	283	239	298	265	288	1645	85	83	83	521	0.000	6.53	0.77	4.8	1.091	15.6	15.64	81	6.8	6.8	89.4
87	85	385	311	244	311	279	306	1647	85	83	83	524	0.000	6.12	0.77	4.8	0.929	15.7	15.78	69	6.9	6.8	90.9
92	90	409	335	253	307	294	319	1630	85	85	85	521	0.000	5.67	0.77	4.9	0.573	15.8	15.73	42	7.0	7.0	94.2
97	95	429	357	259	305	303	331	1602	86	86	86	522	0.000	5.31	0.72	5.2	0.399	15.6	15.46	29	7.1	7.2	95.9
102	100	479	377	273	309	316	351	1509	86	86	86	509	0.000	4.90	0.72	6.1	0.099	14.7	14.58	6	7.6	7.7	99.1
107	105	496	397	284	312	320	362	1529	88	86	86	498	0.000	4.58	0.64	6.7	0.077	14.2	14.08	5	7.9	7.9	99.3
112	110	505	407	292	301	327	367	1574	86	86	86	509	0.000	4.22	0.63	5.7	0.124	15.2	15.18	8	7.4	7.4	98.9
117	115	518	421	301	310	334	377	1553	88	86	86	501	0.000	3.90	0.64	6.1	0.076	14.8	14.91	4	7.6	7.5	99.4

Rec #	Tst .ET	Top Tmp F	Rht Avg F	Lft Tmp F	Bak Tmp F	Bot Tmp F	Avg Stove F	Ext1 F	Ext2 F	Ext3 F	Ext4 F	Stk Tmp F	Stk Drft "H2O	Scale kg	10min Drop kg	Stk .O2 %	Stk CO %	Stk CO2 %	Inc CO2 %	CO Fac g/kg	Stk AF	Inc AF	Comb Effic %
122	120	525	438	308	304	340	383	1484	88	86	86	490	0.000	3.63	0.50	6.9	0.098	14.0	13.62	6	8.0	8.2	99.1
127	125	540	449	317	295	343	389	1510	89	86	86	490	0.000	3.31	0.54	6.5	0.084	14.4	14.70	5	7.8	7.6	99.3
132	130	579	462	330	280	345	399	1402	89	86	86	471	0.000	3.04	0.54	8.3	0.232	12.6	12.47	20	8.7	8.8	97.1
137	135	594	473	343	278	345	407	1353	89	87	89	460	0.000	2.81	0.46	9.2	0.226	11.6	11.73	21	9.3	9.3	97.0
142	140	602	480	352	267	345	409	1381	89	87	87	454	0.000	2.54	0.45	9.1	0.194	11.7	11.84	17	9.3	9.2	97.5
147	145	600	478	358	272	343	410	1301	89	87	89	450	0.000	2.36	0.36	10.0	0.186	10.8	10.98	18	10.0	9.9	97.5
152	150	594	476	365	254	343	407	1280	89	89	89	441	0.000	2.18	0.31	10.3	0.137	10.5	10.42	13	10.2	10.4	98.1
153	151	592	476	365	261	341	407	1270	89	87	87	441	0.000	2.13	0.32	10.5	0.134	10.4	10.42	12	10.4	10.4	98.2

Rec #	Tst .ET	Top Tmp F	Rht Avg F	Lft Tmp F	Bak Tmp F	Bot Tmp F	Avg Stove F	Ext1 F	Ext2 F	Ext3 F	Ext4 F	Stk Tmp F	Stk Drft "H2O	Scale kg	10min Drop kg	Stk .O2 %	Stk CO %	Stk CO2 %	Inc CO2 %	CO Fac g/kg	Stk AF	Inc AF	Comb Effic %

* Real time data is presented at 5 minute intervals. Average values appearing in this report are based on more frequent measurements

Notes:

Results Table = HHT
Filename = DauntCatCord1909211
Test Stand A
ASTM Maple, high

Stove Name: DauntCatCord Test Date: 9/21/2019 Run #: 2 File: DauntCatCord19 Record # Start 27 Stop 505

Test Time	478	min
Wet Wood	10.02	kg
Moisture	21	dry %
Dry Wood	8.28	kg
Coal Bed	1.32	kg
Stove DeltaT	-136	deg F
Tunnel CD	0.933	

Avg Stack Gasses (amb Corrected)

CO	0.533	%
CO2	7.62	%
O2	12.95	%
HC	n/m	% as CH4
TCC	1.07	% as CO2

Results

Real Time Data*

Rec #	Tst .ET	Top Tmp F	Rht Avg F	Lft Tmp F	Bak Tmp F	Bot Tmp F	Avg Stove F	Ext1 F	Ext2 F	Ext3 F	Ext4 F	Stk Tmp F	Stk Drft "H2O	Scale kg	10min Drop kg	Stk .O2 %	Stk CO %	Stk CO2 %	Inc CO2 %	CO Fac g/kg	Stk AF	Inc AF	Comb Effic %
0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	0.00	0.00	0.0	0.000	0.0	0.00	0	0.0	0.0	0.0
5	5	489	416	381	205	326	363	1045	88	88	88	305	0.000	1.68	0.59	12.9	0.555	7.8	7.02	82	12.8	13.7	89.3
10	10	461	398	372	203	322	351	1068	88	88	88	311	0.000	1.59	0.18	12.1	0.212	8.8	8.02	26	11.9	12.7	96.4
15	15	450	385	364	212	318	346	1200	88	88	88	314	0.000	1.50	0.18	10.8	0.114	10.1	10.74	11	10.7	10.1	98.5
20	20	463	375	357	206	314	343	1147	88	86	88	301	0.000	1.41	0.18	12.2	0.169	8.7	8.56	20	12.1	12.3	97.1
25	25	459	366	351	195	307	336	1155	88	86	88	299	0.000	1.32	0.13	12.4	0.118	8.5	8.56	13	12.4	12.3	98.1
27	0	457	364	349	197	305	334	1099	88	86	88	294	0.000	4.54	-3.09	13.1	0.121	7.8	8.22	15	13.4	12.8	97.8
32	5	377	349	333	199	301	312	1390	88	86	88	331	0.000	11.11	-9.75	10.3	0.085	10.6	10.61	7	10.2	10.2	99.0
37	10	331	325	314	225	294	298	1443	88	86	86	349	0.000	10.93	0.36	9.6	0.120	11.3	11.10	10	9.6	9.8	98.5
42	15	308	305	297	234	290	287	1482	86	88	86	355	0.000	10.66	0.41	10.1	0.087	10.8	11.10	7	10.1	9.8	99.0
47	20	295	290	284	245	286	280	1555	88	86	86	364	0.000	10.43	0.41	8.9	0.092	12.0	10.68	7	9.1	10.2	99.0
52	25	282	275	271	260	282	274	1546	88	86	86	375	0.000	10.20	0.41	8.7	0.083	12.2	12.08	6	9.0	9.1	99.2
57	30	280	267	262	258	275	268	1590	86	86	86	382	0.000	9.98	0.41	8.4	0.102	12.5	12.19	8	8.8	9.0	98.9
62	35	280	260	254	269	273	267	1618	88	86	88	393	0.000	9.66	0.50	7.9	0.281	12.9	12.97	24	8.5	8.4	96.6
67	40	284	252	249	291	267	268	1618	89	86	86	397	0.000	9.39	0.54	7.6	0.488	13.1	13.07	42	8.2	8.3	94.2
72	45	293	247	247	284	265	267	1598	89	86	86	401	0.000	9.12	0.49	7.8	0.282	13.0	12.97	23	8.4	8.5	96.7
77	50	299	247	245	299	263	271	1607	89	87	89	406	0.000	8.89	0.45	7.4	0.372	13.3	13.16	31	8.2	8.2	95.6
82	55	317	250	247	302	260	275	1564	89	87	87	404	0.000	8.62	0.45	7.9	0.140	13.0	12.71	10	8.5	8.7	98.5
87	60	336	258	247	302	258	280	1478	89	87	89	393	0.000	8.39	0.45	9.5	0.174	11.3	12.05	16	9.6	9.1	97.7
92	65	345	267	250	282	258	280	1470	89	87	87	389	0.000	8.12	0.45	9.0	0.096	11.9	12.22	7	9.2	9.0	99.0
97	70	350	276	250	280	258	283	1504	89	87	89	387	0.000	7.89	0.41	8.6	0.090	12.3	11.98	6	9.0	9.2	99.1
102	75	358	280	252	282	256	286	1444	89	89	89	380	0.000	7.62	0.45	9.6	0.080	11.3	11.20	6	9.7	9.8	99.1
107	80	369	285	254	289	257	291	1413	89	87	89	380	0.000	7.39	0.46	9.1	0.109	11.8	10.96	8	9.3	9.9	98.8
112	85	382	289	257	278	257	293	1333	89	87	87	374	0.000	7.21	0.41	10.5	0.174	10.3	10.22	17	10.4	10.5	97.5
117	90	389	293	257	265	257	292	1521	89	87	87	393	0.000	6.94	0.41	6.7	0.707	13.9	13.57	59	7.7	8.1	92.1

Rec #	Tst .ET	Top Tmp F	Rht Avg F	Lft Tmp F	Bak Tmp F	Bot Tmp F	Avg Stove F	Ext1 F	Ext2 F	Ext3 F	Ext4 F	Stk Tmp F	Stk Drft "H2O	Scale kg	10min Drop kg	Stk .O2 %	Stk CO %	Stk CO2 %	Inc CO2 %	CO Fac g/kg	Stk AF	Inc AF	Comb Effic %
122	95	417	300	263	274	254	302	1304	89	87	87	372	0.000	6.76	0.41	10.8	0.238	10.1	9.83	25	10.6	10.7	96.4
127	100	402	306	265	278	252	301	1479	89	87	89	378	0.000	6.53	0.36	8.3	0.119	12.6	11.52	9	8.8	9.5	98.7
132	105	443	311	267	270	252	309	1411	89	87	87	380	0.000	6.26	0.41	8.8	0.096	12.1	11.80	7	9.1	9.3	99.0
137	110	476	317	274	272	250	318	1366	89	87	87	376	0.000	6.08	0.41	9.2	0.357	11.6	11.59	34	9.3	9.4	95.2
142	115	484	322	278	276	248	322	1241	89	87	87	356	0.000	5.90	0.36	11.2	0.780	9.4	9.25	96	10.7	10.8	87.7
147	120	491	326	283	252	250	320	1127	89	87	87	341	0.000	5.71	0.32	11.8	0.963	8.7	8.72	129	11.2	11.3	84.3
152	125	497	330	287	250	250	323	1088	89	87	87	328	0.000	5.58	0.27	12.3	1.103	8.1	8.15	158	11.7	11.6	81.4
157	130	480	335	287	242	248	318	1343	89	87	87	354	0.000	5.35	0.32	9.4	0.615	11.3	12.43	62	9.3	8.8	91.6
162	135	523	335	291	246	246	328	1354	89	87	87	367	0.000	5.08	0.45	8.2	0.375	12.6	12.30	33	8.6	8.8	95.4
167	140	532	335	298	246	246	331	1025	89	87	87	339	0.000	4.90	0.41	11.7	1.551	8.5	9.42	215	10.8	10.0	76.6
172	145	515	330	304	239	244	327	946	89	87	87	313	0.000	4.76	0.32	12.6	1.333	7.6	7.59	204	11.9	12.0	77.5
177	150	467	326	302	226	244	313	1194	87	87	87	333	0.000	4.58	0.27	10.2	0.749	10.4	10.01	83	9.8	10.1	89.2
182	155	441	322	298	231	244	307	1390	87	87	87	363	0.000	4.35	0.37	8.0	0.244	12.9	12.94	20	8.5	8.4	97.1
187	160	450	320	298	259	244	314	1464	89	87	87	370	0.000	4.13	0.41	7.5	0.734	13.1	13.09	64	8.1	8.1	91.4
192	165	454	317	300	261	242	315	1438	87	87	87	372	0.000	3.95	0.36	7.9	0.437	12.8	12.74	38	8.5	8.5	94.7
197	170	450	317	300	255	242	313	1373	87	87	87	363	0.000	3.76	0.32	9.2	0.090	11.7	12.40	7	9.3	8.9	99.0
202	175	456	317	304	261	244	317	1299	87	87	87	350	0.000	3.63	0.27	10.2	0.129	10.7	10.45	12	10.1	10.3	98.3
207	180	465	317	309	265	244	320	1249	87	87	87	346	0.000	3.49	0.23	10.9	0.246	9.9	10.13	27	10.7	10.6	96.2
212	185	512	317	315	248	246	328	1101	87	87	87	330	0.000	3.36	0.22	11.3	0.976	9.2	9.00	123	10.7	10.7	84.8
217	190	540	322	324	237	246	334	981	87	85	87	315	0.000	3.17	0.28	12.2	1.290	8.1	8.44	185	11.4	11.0	79.1
222	195	540	324	326	222	246	331	895	87	85	85	293	0.000	3.08	0.23	12.9	1.078	7.5	7.46	167	12.4	12.5	80.7
227	200	530	324	328	220	248	330	841	87	85	85	280	0.000	2.99	0.14	13.5	0.913	7.0	7.22	150	13.3	12.8	82.2
232	205	508	324	326	198	246	320	799	85	85	85	269	0.000	2.95	0.09	13.6	0.819	7.0	7.04	136	13.5	13.4	83.6
237	210	493	322	328	192	246	316	763	85	85	85	259	0.000	2.86	0.13	13.8	0.890	6.7	6.85	153	13.7	13.5	82.0
242	215	471	319	326	181	243	308	734	85	83	85	250	0.000	2.81	0.09	13.9	0.840	6.6	6.61	146	14.0	14.1	82.6
247	220	456	317	326	183	243	305	713	85	85	85	241	0.000	2.77	0.04	14.2	0.814	6.4	6.32	148	14.4	14.5	82.4
252	225	447	313	323	172	241	299	696	85	83	83	237	0.000	2.72	0.09	14.2	0.699	6.4	6.38	125	14.6	14.7	84.6
257	230	439	313	324	174	241	298	683	85	83	83	230	0.000	2.68	0.09	14.2	0.660	6.4	6.35	119	14.7	14.8	85.3
262	235	434	310	321	168	241	295	672	82	82	82	226	0.000	2.68	0.04	14.3	0.659	6.3	6.31	119	14.7	14.9	85.3
267	240	427	310	321	161	237	291	657	82	82	82	224	0.000	2.63	0.05	14.3	0.642	6.3	6.30	116	14.8	14.9	85.6
272	245	425	310	319	161	234	290	645	82	82	82	219	0.000	2.63	0.05	14.3	0.647	6.4	6.31	116	14.7	14.9	85.5
277	250	421	308	319	152	234	287	636	84	82	82	217	0.000	2.59	0.09	14.3	0.681	6.3	6.20	124	14.8	15.0	84.8
282	255	419	308	314	157	230	285	625	82	82	82	215	0.000	2.54	0.09	14.4	0.683	6.2	6.18	126	14.9	15.1	84.6
287	260	414	308	314	150	230	283	619	82	82	82	215	0.000	2.49	0.10	14.4	0.695	6.2	6.12	129	15.0	15.2	84.2
292	265	412	305	310	148	225	280	612	82	82	82	212	0.000	2.45	0.09	14.5	0.691	6.1	6.09	130	15.1	15.2	84.2
297	270	407	305	310	146	223	278	614	82	82	82	210	0.000	2.40	0.09	14.4	0.694	6.2	6.15	129	14.9	15.1	84.3
302	275	403	305	305	156	223	279	608	82	82	82	210	0.000	2.36	0.09	14.5	0.812	6.0	6.00	156	15.0	15.2	81.7
307	280	396	303	303	143	221	273	629	82	82	82	210	0.000	2.36	0.04	14.0	1.005	6.4	6.40	182	14.0	14.1	79.3
312	285	390	303	303	143	219	272	642	82	82	79	210	0.000	2.31	0.05	14.0	0.953	6.5	6.40	171	14.1	14.2	80.3
317	290	388	301	301	137	216	268	652	79	81	81	210	0.000	2.27	0.09	14.1	0.881	6.4	6.35	160	14.3	14.4	81.3
322	295	387	298	301	145	216	270	650	81	79	79	210	0.000	2.27	0.04	14.2	0.821	6.3	6.28	151	14.5	14.6	82.1
327	300	387	298	301	143	214	269	644	79	79	79	210	0.000	2.22	0.09	14.4	0.782	6.2	6.18	147	14.8	14.8	82.6
332	305	389	298	302	141	214	269	641	81	81	79	207	0.000	2.18	0.04	14.5	0.775	6.1	6.06	146	15.0	15.1	82.6
337	310	389	298	300	138	214	268	635	81	79	79	207	0.000	2.13	0.05	14.6	0.722	6.0	5.98	139	15.3	15.3	83.3
342	315	389	298	300	140	216	269	631	81	79	79	205	0.000	2.09	0.09	14.5	0.749	6.1	6.07	142	15.0	15.1	83.0
347	320	389	296	300	140	213	268	639	81	81	78	205	0.000	2.09	0.04	14.4	0.771	6.2	6.14	144	14.9	14.9	82.8
352	325	389	295	302	138	213	267	647	81	78	78	207	0.000	2.04	0.09	14.4	0.750	6.1	6.12	141	14.9	15.0	83.1

Rec #	Tst .ET	Top Tmp F	Rht Avg F	Lft Tmp F	Bak Tmp F	Bot Tmp F	Avg Stove F	Ext1 F	Ext2 F	Ext3 F	Ext4 F	Stk Tmp F	Stk Drft "H2O	Scale kg	10min Drop kg	Stk .O2 %	Stk CO %	Stk CO2 %	Inc CO2 %	CO Fac g/kg	Stk AF	Inc AF	Comb Effic %
357	330	386	295	302	140	213	267	658	80	80	78	206	0.000	2.00	0.09	14.3	0.763	6.3	6.26	141	14.7	14.7	83.1
362	335	386	293	302	142	211	267	658	80	78	78	209	0.000	1.95	0.09	14.4	0.753	6.1	6.07	142	15.0	15.1	83.0
367	340	386	293	299	144	211	267	649	80	80	78	209	0.000	1.90	0.10	14.7	0.759	5.8	5.87	151	15.5	15.4	82.1
372	345	386	291	299	140	211	265	640	80	78	78	206	0.000	1.90	0.05	14.9	0.729	5.7	5.73	147	15.8	15.8	82.5
377	350	384	290	297	133	210	263	640	78	78	78	204	0.000	1.86	0.04	14.9	0.662	5.7	5.65	134	16.0	16.1	83.8
382	355	379	288	295	135	212	262	636	80	78	78	204	0.000	1.86	0.00	15.1	0.619	5.5	5.48	128	16.5	16.6	84.3
387	360	377	286	292	133	212	260	625	80	78	78	202	0.000	1.81	0.05	15.2	0.599	5.4	5.44	126	16.7	16.7	84.5
392	365	377	286	290	137	208	260	614	80	80	77	204	0.000	1.81	0.05	15.3	0.580	5.3	5.24	124	17.0	17.2	84.7
397	370	373	284	288	135	210	258	604	79	77	77	201	0.000	1.77	0.04	15.6	0.569	5.1	5.07	128	17.6	17.7	84.3
402	375	368	279	286	139	208	256	593	79	77	77	199	0.000	1.72	0.09	15.6	0.640	5.0	5.00	147	17.5	17.7	82.5
407	380	366	277	283	133	205	253	584	77	77	77	199	0.000	1.72	0.05	15.6	0.617	5.0	5.00	141	17.7	17.7	83.1
412	385	364	272	281	137	205	252	590	79	77	77	197	0.000	1.68	0.04	15.5	0.637	5.2	5.05	142	17.3	17.6	83.0
417	390	363	272	279	137	203	251	577	79	79	77	194	0.000	1.63	0.09	15.8	0.601	4.8	4.86	144	18.2	18.2	82.8
422	395	361	268	277	137	201	249	562	79	77	77	194	0.000	1.63	0.05	16.0	0.584	4.7	4.63	143	18.6	18.8	82.9
427	400	359	266	274	132	201	246	549	79	77	77	190	0.000	1.59	0.04	16.2	0.592	4.5	4.50	152	19.2	19.2	82.0
432	405	357	263	272	128	201	244	532	77	77	77	190	0.000	1.59	0.04	16.2	0.567	4.4	4.39	146	19.4	19.6	82.6
437	410	354	261	270	136	198	244	517	79	76	76	185	0.000	1.54	0.05	16.4	0.534	4.2	4.27	144	20.1	20.1	82.8
442	415	350	259	267	123	196	239	506	79	76	76	183	0.000	1.54	0.05	16.6	0.522	4.1	4.06	144	20.6	20.9	82.8
447	420	345	254	263	130	196	238	493	78	78	76	181	0.000	1.50	0.04	16.7	0.517	4.0	3.96	148	21.1	21.2	82.4
452	425	341	254	261	119	196	234	478	78	76	76	177	0.000	1.50	0.04	16.8	0.511	3.8	3.79	152	21.7	22.0	82.1
457	430	337	250	258	123	189	231	462	76	76	76	172	0.000	1.50	0.00	17.2	0.534	3.5	3.71	174	22.9	22.2	80.0
462	435	328	248	254	112	194	227	449	78	76	76	170	0.000	1.45	0.00	17.4	0.479	3.3	3.30	163	23.9	24.1	81.0
467	440	321	245	250	125	194	227	438	76	76	76	166	0.000	1.45	0.00	17.5	0.450	3.2	3.22	160	24.7	24.7	81.3
472	445	315	241	245	118	193	223	423	76	76	76	161	0.000	1.41	0.04	17.6	0.443	3.1	3.06	163	25.3	25.5	81.0
477	450	308	237	243	114	189	218	408	78	76	76	159	0.000	1.41	0.04	17.8	0.428	3.0	2.97	164	26.1	26.1	80.9
482	455	301	232	239	110	189	214	395	76	76	76	157	0.000	1.41	0.00	17.8	0.421	2.9	2.88	167	26.6	26.7	80.7
487	460	295	232	234	110	189	212	382	78	76	76	152	0.000	1.36	0.05	17.9	0.419	2.8	2.81	168	26.8	27.1	80.6
492	465	290	230	232	116	185	211	373	78	76	76	150	0.000	1.36	0.00	17.9	0.414	2.8	2.81	166	26.9	27.1	80.7
497	470	284	223	228	118	184	207	364	75	75	75	146	0.000	1.36	0.00	17.9	0.418	2.8	2.75	166	26.8	27.5	80.7
502	475	279	221	225	107	182	203	358	75	75	75	144	0.000	1.36	0.00	17.9	0.421	2.8	2.80	169	26.8	27.1	80.5
505	478	279	219	223	101	180	200	353	75	75	75	144	0.000	1.32	0.04	17.9	0.437	2.8	2.70	176	26.7	27.8	79.9

Rec #	Tst .ET	Top Tmp F	Rht Avg F	Lft Tmp F	Bak Tmp F	Bot Tmp F	Avg Stove F	Ext1 F	Ext2 F	Ext3 F	Ext4 F	Stk Tmp F	Stk Drft "H2O	Scale kg	10min Drop kg	Stk .O2 %	Stk CO %	Stk CO2 %	Inc CO2 %	CO Fac g/kg	Stk AF	Inc AF	Comb Effic %

* Real time data is presented at 5 minute intervals. Average values appearing in this report are based on more frequent measurements

Notes:

Results Table = HHT
Filename = DauntCatCord1909212
Test Stand A
ASTM Maple, Low

Stove Name: DauntCatCord Test Date: 9/24/2019 Run #: 1 File: DauntCatCord19 Record # Start 7 Stop 154

Test Time	147	min
Wet Wood	8.06	kg
Moisture	21	dry %
Dry Wood	6.66	kg
Coal Bed	1.22	kg
Stove DeltaT	322	deg F
Tunnel CD	0.933	

Avg Stack Gasses (amb Corrected)

CO	0.212	%
CO2	12.67	%
O2	8.03	%
HC	n/m	% as CH4
TCC	0.43	% as CO2

Results

Real Time Data*

Rec #	Tst .ET	Top Tmp F	Rht Avg F	Lft Tmp F	Bak Tmp F	Bot Tmp F	Avg Stove F	Ext1 F	Ext2 F	Ext3 F	Ext4 F	Stk Tmp F	Stk Drft "H2O	Scale kg	10min Drop kg	Stk .O2 %	Stk CO %	Stk CO2 %	Inc CO2 %	CO Fac g/kg	Stk AF	Inc AF	Comb Effic %
0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	0.00	0.00	0.0	0.000	0.0	0.00	0	0.0	0.0	0.0
5	5	79	77	77	81	77	78	77	77	79	77	77	0.000	1.50	-1.50	20.9	0.020	0.0	0.00	0	90.9	92.0	0.0
7	0	79	75	77	79	77	77	75	77	77	77	94	0.000	1.45	-1.45	20.8	0.024	0.1	0.00	0	84.9	92.2	0.0
12	5	132	79	81	77	75	89	79	77	77	77	216	0.000	1.36	0.14	17.7	0.080	3.2	3.29	22	26.6	26.2	96.9
17	10	225	90	96	86	75	114	90	77	77	77	390	0.000	1.13	0.32	14.6	0.143	6.3	6.35	22	15.8	15.5	96.8
22	15	255	101	115	92	79	129	701	79	79	77	260	0.000	3.13	-1.81	18.4	0.282	2.4	2.03	128	30.5	33.1	84.3
27	20	236	107	122	141	82	137	1496	79	79	79	448	0.000	2.72	-1.63	5.9	0.305	14.9	14.89	22	7.4	7.0	96.9
32	25	251	116	131	176	88	152	1520	80	80	80	470	0.000	2.27	0.77	6.5	0.260	14.3	14.70	20	7.7	7.5	97.2
37	30	279	129	141	204	101	171	1535	80	80	80	477	0.000	1.90	0.73	6.8	0.076	14.1	14.02	4	7.9	8.0	99.4
42	35	318	148	154	227	116	193	1439	80	80	80	479	0.000	1.54	0.68	6.5	0.072	14.4	13.32	4	7.8	8.4	99.4
47	40	342	165	169	232	133	208	1607	80	82	80	486	0.000	1.18	0.63	7.6	0.057	13.3	13.42	3	8.4	8.3	99.6
52	45	312	176	176	243	152	212	1756	82	80	80	496	0.000	8.89	-7.44	8.0	0.099	12.9	13.31	7	8.6	8.3	99.0
57	50	290	180	180	264	167	216	1756	82	82	80	505	0.000	8.57	0.64	6.8	0.121	14.1	13.96	8	7.9	8.0	98.8
62	55	282	180	182	282	182	222	1792	82	82	80	518	0.000	8.21	0.63	6.4	0.137	14.5	14.65	9	7.7	7.6	98.7
67	60	286	184	187	303	195	231	1752	82	82	82	540	0.000	7.80	0.68	5.1	1.059	15.4	15.21	80	6.9	7.1	89.5
72	65	297	191	195	306	206	239	1696	84	82	82	535	0.000	7.44	0.68	6.0	0.236	14.8	14.61	17	7.5	7.6	97.6
77	70	308	197	208	295	219	245	1666	82	80	82	542	0.000	7.07	0.64	6.4	0.546	14.3	14.55	43	7.6	7.4	94.0
82	75	317	204	221	304	239	257	1679	82	82	82	525	0.000	6.67	0.68	6.6	0.110	14.3	14.24	7	7.8	7.8	99.0
87	80	325	215	230	308	258	267	1644	84	82	82	512	0.000	6.35	0.63	8.0	0.052	13.0	13.31	2	8.6	8.4	99.7
92	85	338	223	241	303	280	277	1657	84	82	82	514	0.000	5.99	0.63	7.2	0.055	13.7	13.59	3	8.2	8.2	99.6
97	90	358	234	252	308	297	290	1657	84	82	82	514	0.000	5.67	0.59	7.1	0.056	13.8	13.74	3	8.1	8.1	99.6
102	95	380	247	258	308	310	301	1683	82	82	82	514	0.000	5.31	0.59	7.3	0.054	13.6	13.90	3	8.2	8.1	99.6
107	100	401	258	271	306	323	312	1727	82	82	82	542	0.000	4.94	0.64	5.6	0.727	15.0	14.89	56	7.2	7.5	92.4
112	105	460	277	290	306	334	333	1531	84	82	82	516	0.000	4.54	0.72	6.5	0.059	14.4	13.64	3	7.8	8.2	99.6
117	110	499	288	319	310	340	351	1549	84	82	82	507	0.000	4.17	0.68	7.0	0.082	13.9	13.50	5	8.0	8.3	99.3

Rec #	Tst .ET	Top Tmp F	Rht Avg F	Lft Tmp F	Bak Tmp F	Bot Tmp F	Avg Stove F	Ext1 F	Ext2 F	Ext3 F	Ext4 F	Stk Tmp F	Stk Drft "H2O	Scale kg	10min Drop kg	Stk .O2 %	Stk CO %	Stk CO2 %	Inc CO2 %	CO Fac g/kg	Stk AF	Inc AF	Comb Effic %
122	115	503	299	345	295	345	357	1568	82	82	82	522	0.000	3.81	0.63	5.9	0.141	15.0	14.45	9	7.5	7.7	98.7
127	120	535	310	373	299	349	373	1410	84	82	82	503	0.000	3.54	0.59	7.8	0.320	12.9	13.16	27	8.4	8.4	96.2
132	125	552	323	403	295	349	384	1480	84	82	82	501	0.000	3.22	0.54	7.5	0.336	13.3	13.70	28	8.2	8.0	96.1
137	130	572	334	416	290	349	392	1604	82	82	82	511	0.000	2.86	0.59	6.3	0.367	14.4	14.73	28	7.6	7.5	96.0
142	135	572	351	420	295	344	396	1641	84	82	82	522	0.000	2.54	0.63	5.6	1.025	14.8	14.63	81	7.2	7.2	89.5
147	140	559	364	418	305	342	398	1524	84	82	82	498	0.000	2.27	0.54	7.6	0.076	13.3	13.88	5	8.4	7.9	99.3
152	145	567	370	429	273	340	396	1300	84	82	82	472	0.000	2.09	0.40	9.9	0.129	11.0	10.65	11	9.9	10.1	98.4
154	147	574	377	433	277	340	400	1244	84	82	82	462	0.000	2.00	0.36	10.5	0.284	10.3	10.07	30	10.3	10.5	95.7

Rec #	Tst .ET	Top Tmp F	Rht Avg F	Lft Tmp F	Bak Tmp F	Bot Tmp F	Avg Stove F	Ext1 F	Ext2 F	Ext3 F	Ext4 F	Stk Tmp F	Stk Drft "H2O	Scale kg	10min Drop kg	Stk .O2 %	Stk CO %	Stk CO2 %	Inc CO2 %	CO Fac g/kg	Stk AF	Inc AF	Comb Effic %

* Real time data is presented at 5 minute intervals. Average values appearing in this report are based on more frequent measurements

Notes:

Results Table = HHT
Filename = DauntCatCord1909241
Test Stand A

Stove Name: DauntCatCord Test Date: 9/24/2019 Run #: 2 File: DauntCatCord19 Record # Start 13 Stop 232

Test Time	219	min
Wet Wood	9.56	kg
Moisture	21	dry %
Dry Wood	7.90	kg
Coal Bed	1.5	kg
Stove DeltaT	-32	deg F
Tunnel CD	0.933	

Avg Stack Gasses (amb Corrected)

CO	0.826	%
CO2	11.30	%
O2	9.10	%
HC	n/m	% as CH4
TCC	1.65	% as CO2

Results

Real Time Data*

Rec #	Tst .ET	Top Tmp F	Rht Avg F	Lft Tmp F	Bak Tmp F	Bot Tmp F	Avg Stove F	Ext1 F	Ext2 F	Ext3 F	Ext4 F	Stk Tmp F	Stk Drft "H2O	Scale kg	10min Drop kg	Stk .O2 %	Stk CO %	Stk CO2 %	Inc CO2 %	CO Fac g/kg	Stk AF	Inc AF	Comb Effic %
0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	0.00	0.00	0.0	0.000	0.0	0.00	0	0.0	0.0	0.0
5	5	485	357	409	214	340	361	914	81	81	79	303	0.000	1.63	0.50	13.9	0.656	6.7	6.64	112	14.1	14.3	86.0
10	10	476	351	401	214	342	357	872	81	79	79	298	0.000	1.54	0.14	13.9	0.685	6.7	6.73	117	14.1	14.1	85.4
13	0	474	348	396	203	340	352	881	81	79	79	303	0.000	1.63	0.00	13.9	0.746	6.7	6.68	129	14.0	14.2	84.3
18	5	390	333	374	218	335	330	1462	81	79	79	355	0.000	10.79	-9.20	7.8	1.862	12.2	12.32	180	8.0	7.8	79.5
23	10	342	318	351	223	327	312	1563	81	79	79	385	0.000	10.48	0.50	7.6	0.774	13.0	12.67	69	8.2	8.2	90.9
28	15	309	298	331	249	318	301	1628	81	79	79	411	0.000	10.20	0.50	7.2	0.869	13.3	13.23	76	7.9	7.9	90.0
33	20	296	288	314	264	309	294	1643	79	79	79	435	0.000	9.89	0.54	6.8	1.314	13.5	13.29	114	7.6	7.8	85.8
38	25	292	277	305	268	303	289	1650	81	79	79	446	0.000	9.57	0.59	6.9	1.331	13.4	13.32	116	7.6	7.7	85.6
43	30	290	270	298	272	296	285	1667	81	79	79	468	0.000	9.21	0.63	6.2	2.016	13.7	13.63	172	7.2	7.3	80.2
48	35	292	266	294	300	285	287	1658	81	79	79	481	0.000	8.84	0.68	6.3	2.016	13.6	13.72	173	7.2	7.2	80.1
53	40	296	266	289	300	283	287	1660	81	79	79	482	0.000	8.44	0.68	6.2	2.016	13.7	13.79	172	7.2	7.2	80.2
58	45	305	264	285	318	279	290	1676	81	79	79	494	0.000	8.03	0.68	6.0	2.016	14.0	13.97	169	7.1	7.1	80.4
63	50	313	266	283	326	272	292	1691	81	79	79	500	0.000	7.62	0.72	5.8	2.016	14.1	14.07	168	7.0	7.1	80.6
68	55	320	268	283	311	272	291	1687	81	79	81	502	0.000	7.21	0.77	5.8	2.016	14.1	14.19	167	7.0	7.0	80.7
73	60	331	270	285	333	270	298	1682	81	81	79	502	0.000	6.80	0.73	5.7	2.016	14.2	14.21	166	7.0	7.0	80.8
78	65	344	274	289	326	270	301	1671	81	79	79	502	0.000	6.39	0.73	5.7	2.016	14.2	14.26	166	7.0	7.0	80.8
83	70	361	279	298	322	270	306	1673	81	81	79	498	0.000	5.99	0.72	5.7	2.016	14.2	14.28	166	7.0	7.0	80.7
88	75	400	285	311	331	270	319	1675	81	79	81	500	0.000	5.62	0.68	5.6	2.016	14.4	14.52	165	6.9	6.9	80.9
93	80	417	291	333	328	268	328	1673	83	81	81	498	0.000	5.31	0.59	5.6	1.995	14.3	14.49	163	7.0	6.9	81.0
98	85	510	300	348	341	268	354	1654	83	81	79	495	0.000	4.94	0.64	5.6	1.333	14.7	14.76	105	7.1	7.0	86.7
103	90	487	307	359	331	268	350	1671	81	81	81	493	0.000	4.63	0.59	5.9	1.517	14.3	14.32	124	7.2	7.2	84.7
108	95	484	307	370	328	270	352	1671	83	81	81	495	0.000	4.35	0.55	5.8	1.604	14.4	14.37	131	7.1	7.1	84.1
113	100	487	309	383	343	268	358	1678	83	81	81	489	0.000	4.08	0.50	6.2	0.757	14.4	14.41	60	7.5	7.4	91.9
118	105	484	311	400	339	270	361	1686	83	81	81	482	0.000	3.81	0.45	6.8	0.549	13.9	13.83	45	7.8	7.7	93.8

Rec #	Tst .ET	Top Tmp F	Rht Avg F	Lft Tmp F	Bak Tmp F	Bot Tmp F	Avg Stove F	Ext1 F	Ext2 F	Ext3 F	Ext4 F	Stk Tmp F	Stk Drft "H2O	Scale kg	10min Drop kg	Stk .O2 %	Stk CO %	Stk CO2 %	Inc CO2 %	CO Fac g/kg	Stk AF	Inc AF	Comb Effic %
123	110	568	322	411	337	270	382	1627	83	81	81	469	0.000	3.58	0.41	6.7	0.235	14.1	14.34	18	7.8	7.7	97.5
128	115	598	335	415	315	272	387	1567	83	81	81	443	0.000	3.36	0.45	7.6	0.106	13.3	13.10	7	8.3	8.5	99.0
133	120	611	343	415	307	272	390	1562	83	81	81	426	0.000	3.13	0.36	8.3	0.086	12.6	12.57	6	8.8	8.8	99.2
138	125	579	348	411	304	272	383	1489	81	81	81	402	0.000	2.95	0.36	8.7	0.089	12.2	11.91	6	9.0	9.2	99.1
143	130	551	352	402	278	272	371	1513	83	81	81	367	0.000	2.77	0.36	9.4	0.217	11.5	11.51	20	9.4	9.5	97.1
148	135	530	350	395	280	272	365	1432	83	81	81	350	0.000	2.63	0.27	9.2	0.323	11.6	10.73	31	9.3	9.9	95.7
153	140	491	343	384	261	274	351	1326	83	80	80	339	0.000	2.54	0.23	12.0	0.217	8.9	8.77	26	11.8	11.9	96.3
158	145	473	334	378	256	276	344	1286	80	78	80	339	0.000	2.45	0.18	11.7	0.170	9.2	9.12	19	11.5	11.7	97.3
163	150	456	328	371	243	276	335	1280	80	80	78	347	0.000	2.36	0.18	11.3	0.064	9.6	9.38	5	11.2	11.4	99.2
168	155	471	323	373	230	276	335	1242	80	78	78	352	0.000	2.27	0.18	11.8	0.065	9.2	9.05	6	11.6	11.8	99.2
173	160	458	317	377	232	275	332	1188	80	78	78	351	0.000	2.18	0.18	12.5	0.082	8.4	8.51	8	12.5	12.4	98.8
178	165	453	312	384	225	271	329	1143	80	78	78	345	0.000	2.09	0.18	12.9	0.101	8.0	8.06	12	13.0	13.0	98.3
183	170	447	310	384	217	273	326	1108	80	78	78	336	0.000	2.04	0.14	13.2	0.118	7.6	7.68	15	13.5	13.5	97.8
188	175	447	308	386	212	273	325	1087	80	80	78	329	0.000	2.00	0.09	13.3	0.136	7.6	7.53	18	13.5	13.7	97.5
193	180	444	305	381	204	273	322	1046	80	77	77	323	0.000	1.95	0.09	13.8	0.191	7.0	7.19	28	14.4	14.1	96.0
198	185	442	305	381	202	273	321	1003	77	77	77	316	0.000	1.90	0.05	14.0	0.230	6.8	6.71	37	14.7	14.9	94.9
203	190	438	305	379	193	275	318	955	78	78	78	310	0.000	1.86	0.09	14.4	0.306	6.4	6.43	53	15.3	15.3	92.7
208	195	438	303	375	191	271	315	957	77	77	77	305	0.000	1.81	0.05	13.8	0.272	7.0	6.98	43	14.3	14.3	94.1
213	200	453	305	375	197	273	320	1011	77	77	77	307	0.000	1.72	0.09	12.2	0.202	8.6	8.72	25	12.1	12.0	96.5
218	205	468	305	375	191	270	322	1019	79	77	77	309	0.000	1.68	0.09	12.6	0.203	8.3	8.20	26	12.5	12.6	96.3
223	210	472	309	375	186	270	323	998	77	77	77	309	0.000	1.59	0.09	13.1	0.276	7.7	7.78	40	13.2	13.1	94.5
228	215	476	312	374	190	270	325	967	77	77	77	305	0.000	1.59	0.04	13.5	0.321	7.3	7.24	49	13.7	13.8	93.3
232	219	476	309	370	184	270	322	930	77	77	77	301	0.000	1.50	0.09	13.8	0.380	7.0	6.84	61	14.1	14.3	91.8

Rec #	Tst .ET	Top Tmp F	Rht Avg F	Lft Tmp F	Bak Tmp F	Bot Tmp F	Avg Stove F	Ext1 F	Ext2 F	Ext3 F	Ext4 F	Stk Tmp F	Stk Drft "H2O	Scale kg	10min Drop kg	Stk .O2 %	Stk CO %	Stk CO2 %	Inc CO2 %	CO Fac g/kg	Stk AF	Inc AF	Comb Effic %

* Real time data is presented at 5 minute intervals. Average values appearing in this report are based on more frequent measurements

Notes:

Results Table = HHT
Filename = DauntCatCord1909242
Test Stand A
ASTM Maple, medium (4 clicks from closed)

2 Operating Instructions

A. The Dauntless FlexBurn® Controls

Two controls regulate the performance of the Dauntless FlexBurn®: a **primary air control** supplies oxygen for the fire, and a **damper** directs air flow within the stove to activate and deactivate the combustion system, Figure 2.1.

Symbols on the stove are reminders of the correct directions for using the controls. The words 'Left' and 'Right' in these directions are *facing the stove*.

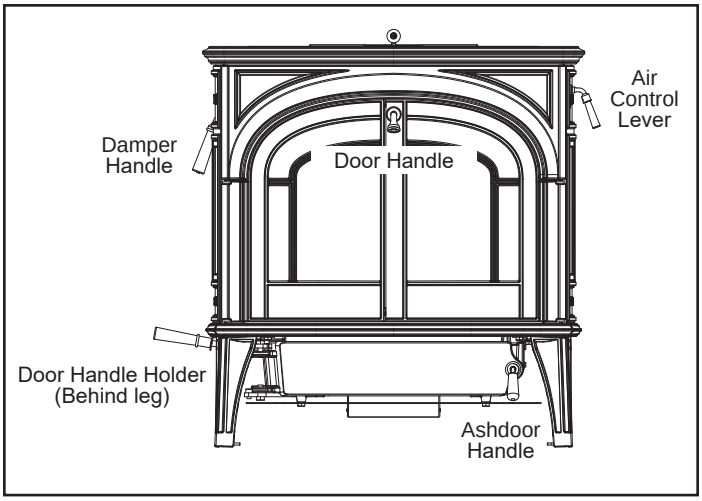


Figure 2.1 - The Dauntless FlexBurn® controls are conveniently located and easy to operate.

A Single Air Control Regulates Heat Output and Burn Time

The **primary air control lever**, on the right of the stove, controls the amount of incoming air for starting, maintaining, and reviving a fire.

Once the air control is manually set, a bi-metallic thermostat automatically maintains the heat output at a constant level for a more even heat over the life of the burn.

More air entering the stove makes the fire burn hotter and faster, while less air prolongs the burn at a lower heat output level.

For the greatest air supply and maximum heat output (but the shortest burn time), move the lever toward the front of the stove. For a fire that will last longer with less heat, move the lever toward the rear of the unit, Figure 2.2.

⚠ WARNING

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

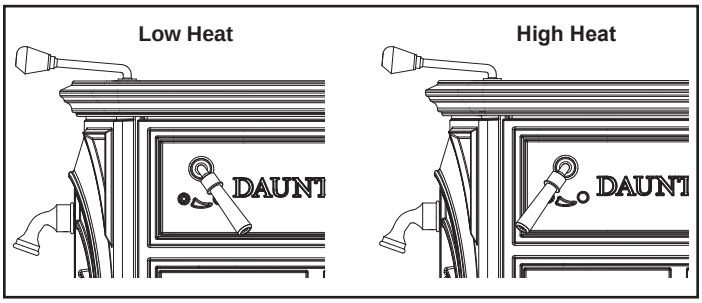


Figure 2.2 - The handle may be positioned anywhere between the two extremes for different heat levels.

A Damper Directs Air Flow Within the Stove

The **damper handle** on the left side of the stove operates the damper to direct air flow within the stove.

The damper is **open** when the handle points to the **rear**, enabling smoke to pass directly into the chimney. The damper must be open when starting or reviving a fire, and whenever the griddle or doors are opened.

The damper is **closed** when the handle points **down.** Smoke travels through the secondary combustion system where it can be further burned, before passing up the chimney, Figure 2.3.

The damper should always be either fully open or fully closed. There are no intermediate positions. When closing the damper, be sure to pull firmly enough to snap the handle into the locked position.

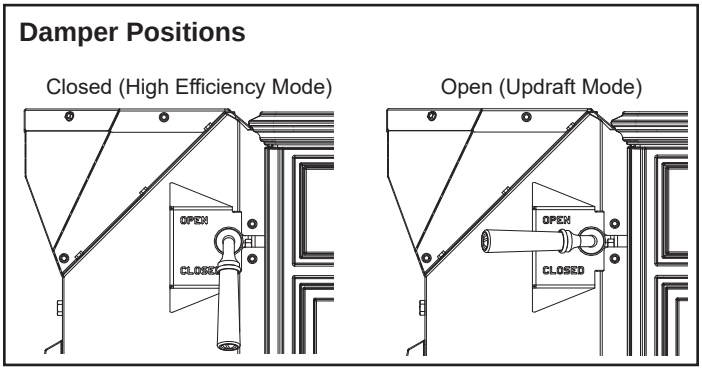


Figure 2.3 - The damper is either open or closed. There are no intermediate positions.

B. Conditioning Your Stove

Cast iron is extremely strong, but it can be broken with a sharp blow from a hammer or from the thermal shock of rapid and extreme temperature change.

The cast plates expand and contract with changes in temperature. When you first begin using your Dauntless FlexBurn®, minimize thermal stress by letting the plates adjust gradually during three or four initial break-in fires.

C. Wood Burning Operation

Burn only solid wood in the Dauntless FlexBurn® Wood Stove, and burn it directly on the grate. Do not elevate the fuel. Do not burn coal or other fuels. In the United States, it is against the law to operate this wood heater in a manner inconsistent with operating instructions in this manual.

The bypass damper must be open when starting a fire or when refueling.

Do not use chemicals or fluids to start the fire. Do not burn garbage. Never use flammable fluids such as gasoline, gasoline type lantern fuel, kerosene, charcoal lighter fluid, naptha, engine oil or similar liquids to start or "freshen up" a fire in this heater. Keep all such liquids well away from the heater while it is in use.

The following procedures are important for reliable, clean and efficient operation of your woodstove. Recommend 16" logs Properly seasoned (up to a year for denser woods) Split to 3" to 6" cross sections

Cold start:

When starting your stove at room temperature and when no burning coals are present the following kindling procedure has been found to be the most reliable.

Stack about 4 lbs of finely split kindling (1" diameter or less 10 to 20 pcs) in a 'log cabin' style directly against the rear wall. Place a small amount of newspaper on top of this pile with one or two small pieces of kindling on top. This is referred to as a top down method and while providing a slower start, also serves to preheat the combustion properly resulting in a reliable start., Figure 2.4.

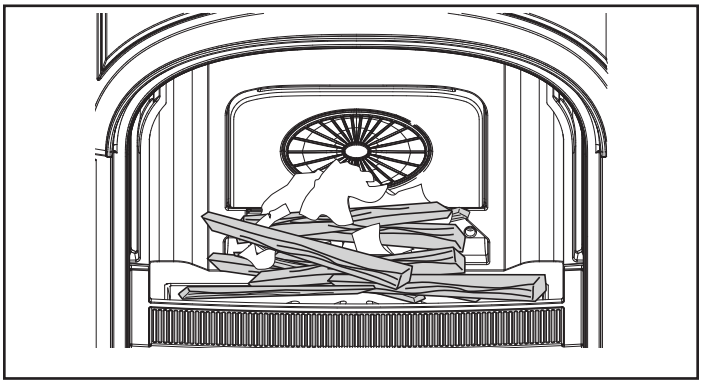


Figure 2.4 - Start the fire with newspaper and dry kindling.

With the bypass damper open and the primary air set to its highest position, light the newspaper. Leave the front door cracked until the kindling ignites, then close the doors.

After most of the kindling has burned into coals (15 to 20 minutes), open the front doors and push remaining coals and unburned wood against the rear wall. Add several pieces of larger split wood between 2 to 3 inches in diameter (about 6 lbs) directly against the rear wall and on top of the kindling coals. Close the doors and bypass to engage the combustion system. The air should remain on high for up to one hour or until the wood is mostly converted to coals.

After a hot bed of coals is produced, open the door and bypass damper and push the remaining coals again toward the rear wall. Add large pieces of wood starting against the rear wall and on top of the coals. Close the doors and bypass immediately after loading the stove.

Ideally, allow this wood load to burn at the highest air setting for the entire wood load. If this is not possible, the wood should burn for at least 30 minutes prior to reducing the primary air setting.

D. Ways to Add Fuel

To open the front doors, insert the handle into the door latch stub and turn it clockwise, Figure 2.5.

To close them, always close the left door first. Turn the handle in the right door to the left and up (to the open position) and close it. Finally, push on the door as you turn the handle counterclockwise. The doors will draw in slightly, and the handle should offer some resistance as you turn it to the closed position.

To reduce the risk of breaking the glass, avoid striking the glass or slamming the doors.

When you are not using the door handle, store it in the holder behind the left front leg of the stove.

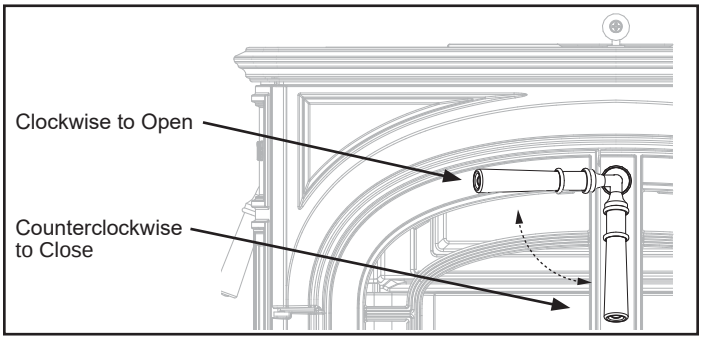


Figure 2.5 - To open the front doors, turn the handle clockwise.

For best results when refueling, wear long-cuffed stove gloves to protect your hands and forearms.

Reloading a hot stove:

When a wood load is added to a hot bed of coals (continuous use), open the bypass damper and either the top or front loading doors. Stir the hot coals to allow ash to fall through the grate. Hot coals should then be pushed against the rear wall and leveled depending on the amount of coals. Add fresh wood and close the loading door and bypass damper. If the coals are glowing and hot, it is possible to set the air control to any setting immediately after loading the stove.

Reloading a warm stove:

If the stove is relatively cold (for instance after a long overnight burn), the coal bed may need to be re-energized prior to adding a large load of wood. Open the bypass damper and either the top or front loading door. Stir the coals to allow ash to fall through the grate. Push the remaining coals toward the rear wall. Close the door(s) and bypass damper and set the primary air to the highest position. Allow the coals to re-ignite and heat the system for 10 to 15 minutes. Once the coals are glowing, a fresh batch of wood may be added following the “hot stove” procedure above.

A proper bed of coals is critical to the performance of the Dauntless stove. The rear refractory wall of the stove should be almost entirely white in color with proper operation. This indicates the combustion system is running at a proper elevated temperature. If the rear wall is black with creosote or develops a dark brown color, it is likely that the coal bed is not sufficiency large enough or hot enough. Revisit the above instructions and adjust the amount of kindling or time at high air settings to get the system hotter. Wood size or excessive moisture may also cause lower than desirable stove temperatures.

While not required, operating your stove with the catalytic combustor installed creates optimum conditions for secondary combustion and will increase your efficiency up to 15% on low burn, making sure you get the most heat out of each load of wood.

The catalytic element is a metal “honeycomb” coated with the catalytic material. The element sits at the bottom of the secondary combustion chamber. Smoke, gases and particulates that are not fully combusted during the secondary combustion process pass through the catalyst, creating a tertiary burn. This results in higher efficiency and lower emissions.

The catalyst will initiate combustion of smoke and particulates at 500° - 600°F (260° - 315°C), half the temperature normally required for unaided secondary combustion. If you followed the startup operation steps in the previous section the stove will be sufficiently hot to allow the combustor to work. Once the combustor starts working, heat generated by burning the smoke will keep it working.

To determine whether the combustor is operating, refer to the temperature probe which shows the operating range of the catalytic combustor. This is located on the back of the stove and is viewed from the top.

NOTE: It will take several minutes after closing the bypass damper for the temperature probe to fully adjust to the new temperature. If the probe indicator is below the operate catalyst range, add fuel or open the bypass damper to allow the fire to further build before engaging the catalyst again.

If the probe indicator is above the operate catalyst range, the catalytic combustor is running too hot and may be damaged. In many cases, decreasing the primary air can reduce the catalyst temperature and adding less wood with each loading can also help if overheating is persistent. Do not add wood to the stove if the probe reads above the operate catalyst range.

Avoid using a full load of very dry wood in the firebox, such as dry slab wood or wood with below 14% moisture content. This may result in continuous very high temperatures in the secondary combustion area and damage the combustor.

Never burn treated wood, garbage, solvents or trash. All of these may poison the catalyst and prevent it from operating properly. Never burn cardboard or loose paper except for kindling purposes. Never burn coal; doing so can produce soot or large flakes of char or fly ash that can coat the combustor and cause smoke to spill into the room. Coal smoke can also poison the catalyst so that it won’t operate properly.

NOTE: The metal catalytic combustor is fragile and will crack if subjected to thermal shock. Thermal shock can occur when refueling with wet wood or closing the bypass damper too early after refueling.

⚠ WARNING

DO NOT OPERATE THE STOVE WITH THE ASH DOOR OPEN. OPERATION WITH THE ASH DOOR OPEN CAN CAUSE AN OVER-FIRING CONDITION TO OCCUR. OVER-FIRING THE STOVE IS DANGEROUS AND CAN RESULT IN PROPERTY DAMAGE, INJURY OR LOSS OF LIFE.

Andirons Help Protect the Glass
Your stove has andirons to keep logs away from the glass panels. The andirons are essential to maintain clear fire viewing, and should be left in place. Since the andirons may slightly hinder refueling through the front doors, most stove owners will prefer the convenience of top loading through the griddle. Do not place fuel between the andirons and the doors.

Burn Only High-Quality Wood
The Dauntless FlexBurn® is designed to burn natural wood only; do not burn fuels other than that for which it was designed.

IMPORTANT: Do not burn any type of artificial or synthetic materials such as fire starter logs (containing wax) in this appliance. Never burn liquid-based fuels such as kerosene, gasoline or alcohol.

Burning any materials not allowed in these instructions, or over-firing the stove, may void the warranty.

You'll enjoy the best results when burning wood that has been adequately air-dried. The wood should be 16" - 18" (406-457 mm) in length. Avoid burning "green" wood that has not been properly seasoned. (**Note:** Properly seasoned firewood has a moisture content below 20 percent.) Do not burn construction materials; they often contain chemicals and metals that can damage the inside surfaces of the stove and pollute the air. Do not burn ocean driftwood; when it burns, the salt it contains will attack the cast iron.

The best hardwood fuels include oak, maple, beech, ash, and hickory that has been split, stacked, and air-dried outside under cover for at least one year.

If hardwood is not available, you can burn softwoods that include tamarack, yellow pine, white pine, Eastern red cedar, fir, and redwood. These should also be properly dried.

Store split wood under cover to keep it dry. Even for short-term storage, be sure to keep wood a safe distance from the stove and keep it out of the areas around the stove used for refueling and ash removal.

Surface Thermometer is a Valuable Guide to Operation
An optional surface thermometer tells you when to adjust the air control, and when to refuel, Figure 2.8.

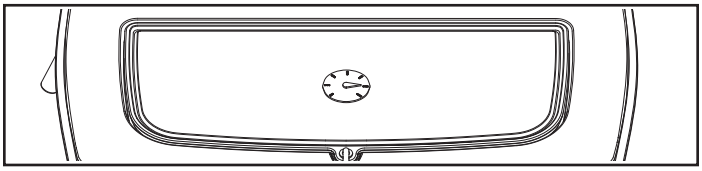


Figure 2.8 - Take temperature readings with a thermometer located in the middle of the griddle.

For example, when the thermometer registers at least 450°F (230°C) on the stove top after start-up you know the stove is hot enough and it may be time to close the damper if a sufficient ember bed has also been established. Note that the stove will warm up much sooner than the chimney, though; a warm chimney is the key to easy, effective stove operation. When thermometer readings drop below 350°F. (175°C) it's time to adjust the air control for a higher burn rate or to reload the stove. A temperature reading over 650°F. (340°C) is a sign to reduce the air supply to slow the burn rate.

Use the following temperature ranges as a guide:

- Readings in the 350°-500°F. (175°-260°C) range indicate low to medium heat output.
- 500°-600°F. (260°-315°C) readings indicate medium heat output.
- Readings of 600°-650°F. (315-340°C) indicate high heat output. Operating your Dauntless FlexBurn® continuously at griddle temperatures higher than 650° F (340°C) may damage the cast iron or enamel finish.

Use the Air Control Settings that Work Best for You
No single air control setting will fit every situation. Each installation will differ depending on the quality of the fuel, the amount of heat desired, and how long you wish the fire to burn; outdoor air temperature and pressure also affect draft.

The control setting also depends on your particular installation's "draft," or the force that moves air from the stove up through the chimney. Draft is affected by such things as the length, type, and location of the chimney, local geography, nearby obstructions, and other factors.

Too much draft may cause excessive temperatures in the Dauntless FlexBurn®, and could even damage the stove. On the other hand, too little draft can cause backpuffing into the room and/or the "plugging" of the chimney.

How do you know if your draft is excessively high or low? Symptoms of too much draft include an uncontrollable burn or a glowing-red stove part. Signs of weak draft are smoke leaking into the room through the stove or chimney connector joints or low heat output.

Run 1

High Burn 1-minute data

Emissions Results (Cold to Hot Cycle)

Wood Heater Test Data

Run: 1

Manufacturer: Hearth & Home
Model: Dauntless NC
Tracking No.: 2389
Project No.: 061WS104E
Test Date: 04-Oct-19
Beginning Clock Time: 10:52

Total Sampling Time: 156 min
Recording Interval: 1 min
Background Sample Volume: _____ cubic feet

Meter Box Y Factor: 0.992 (1) 0.989 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	29.52		29.6	29.56 0

OMNI Equipment Numbers: _____

PM Control Modules: 371, 372
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.284 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 19.53 ft/sec.
Initial Tunnel Flow: 212.8 acfm
Average Tunnel Flow: 205.4 scfm
Post-Test Leak Check (1): 0.000 cfm @ 12 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ 11 in. Hg
Average Test Piece Fuel Moisture: 19.36 Dry Basis %

Technician Signature: _____

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.076	0.084	0.084	0.074	0.074	0.084	0.086	0.076	0.086	"H2O
Temp:	77	77	77	77	77	77	77	77	77	°F

V_{straw} 19.08 ft/sec V_{scent} 19.74 ft/sec F_p 0.967

	Particulate Sampling Data													Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst Exit	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
0	0.000	0.000			1.87	77	0.19	2.32	77	-2.2	77	0.090			3.8		75	74	74	73	74	74	73	74	84	56	84	45	72	0.014	0.23	0.01
1	0.138	0.168	0.14	0.17	2.21	78	0.03	1.73	78	-3.2	84	0.090	80	92	4.2	0.4	75	74	74	73	74	74	74	106	84	45	84	45	72	0.000	0.16	0
2	0.301	0.339	0.16	0.17	2.17	78	0.35	1.78	78	-3.3	83	0.080	100	99	3.7	-0.5	78	74	74	74	74	75	74	123	84	44	84	45	72	-0.007	0.12	0
3	0.467	0.512	0.17	0.17	2.23	78	0.38	1.77	78	-3.2	85	0.090	96	95	3.5	-0.2	88	74	74	75	74	77	75	207	84	44	85	45	72	0.026	0.51	0.04
4	0.630	0.684	0.16	0.17	2.26	78	0.4	1.76	78	-3.3	90	0.090	95	95	3.4	-0.2	113	75	77	76	74	83	75	350	84	44	85	45	72	0.047	1.26	0.05
5	0.794	0.857	0.16	0.17	2.21	78	0.37	1.77	78	-3.4	101	0.080	102	102	3.2	-0.2	145	78	82	79	74	92	76	481	85	44	86	45	72	0.059	4.61	0.11
6	0.956	1.030	0.16	0.17	2.14	78	0.25	1.75	78	-3.4	109	0.080	102	103	3.0	-0.2	176	82	88	82	74	100	77	560	85	44	86	45	73	0.062	7.04	0.15
7	1.114	1.201	0.16	0.17	2.12	78	0.03	1.73	78	-3.5	117	0.080	100	102	2.8	-0.2	209	88	97	87	74	111	79	620	85	44	87	45	73	0.069	8.65	0.21
8	1.273	1.371	0.16	0.17	2.08	78	0	1.74	77	-3.4	116	0.090	95	96	2.7	-0.2	245	93	106	92	74	122	82	580	85	44	87	45	73	0.058	9.82	0.26
9	1.432	1.542	0.16	0.17	2.30	78	-0.14	1.80	78	-3.5	112	0.080	100	102	2.6	-0.1	269	100	113	96	74	130	87	511	85	44	87	45	73	0.057	10.71	0.31
10	1.597	1.716	0.17	0.17	2.28	78	0.29	1.78	77	-3.6	115	0.080	104	104	2.4	-0.2	295	107	119	99	74	139	92	525	85	44	87	45	73	0.060	8.93	0.19
11	1.762	1.889	0.17	0.17	2.24	78	0.35	1.77	78	-3.6	118	0.090	99	98	2.2	-0.2	324	115	126	102	75	148	97	558	85	44	88	45	73	0.064	9.12	0.22
12	1.925	2.062	0.16	0.17	2.26	78	-0.17	1.77	77	-3.6	119	0.090	97	98	2.0	-0.2	349	123	134	106	76	158	103	562	85	45	88	45	73	0.064	10.34	0.33
13	2.089	2.234	0.16	0.17	2.26	78	-0.17	1.77	78	-3.4	119	0.080	104	103	1.8	-0.2	375	131	141	108	77	166	109	562	85	45	88	45	74	0.062	10.48	0.32
14	2.254	2.407	0.17	0.17	2.25	78	0.38	1.78	77	-3.4	119	0.080	105	104	1.7	-0.1	395	137	146	111	79	174	116	549	85	45	88	45	74	0.060	10.49	0.3
15	2.417	2.579	0.16	0.17	2.24	78	0.18	1.77	78	-3.4	116	0.080	103	103	1.5	-0.2	409	142	151	112	80	179	122	511	85	45	88	45	74	0.058	9.76	0.28
16	2.580	2.752	0.16	0.17	2.22	78	0.36	1.76	78	-3.5	137	0.080	105	105	4.9	3.4	418	147	158	114	83	184	204	464	84	45	88	45	74	0.050	8.86	0.29
17	2.743	2.924	0.16	0.17	2.17	78	-0.06	1.76	78	-3.6	112	0.080	103	102	8.0	3.1	404	151	162	113	86	183	600	324	85	45	88	45	74	0.033	8.45	0.29
18	2.904	3.097	0.16	0.17	2.38	78	0.1	1.81	78	-3.8	105	0.090	95	96	6.9	-1.1	387	153	164	114	89	181	746	292	84	45	88	45	74	0.036	5.11	0.34
19	3.067	3.270	0.16	0.17	2.33	78	-0.61	1.75	78	-3.8	110	0.080	103	103	6.7	-0.2	371	155	164	114	93	179	880	269	84	45	87	45	74	0.039	4.24	0.55
20	3.234	3.442	0.17	0.17	2.32	78	-0.6	1.75	78	-3.9	101	0.080	104	101	6.6	-0.2	356	156	163	117	96	178	1262	335	83	45	87	45	74	0.045	5.16	0.45
21	3.400	3.614	0.17	0.17	2.26	78	-0.16	1.75	78	-4.1	100	0.090	98	95	6.5	-0.1	344	156	163	123	99	177	1421	377	83	46	86	45	74	0.048	8.2	0.19
22	3.564	3.787	0.16	0.17	2.23	78	-0.18	1.83	78	-4.4	101	0.080	102	102	6.2	-0.2	334	157	163	132	102	178	1418	403	83	46	86	45	74	0.051	13.26	0.32
23	3.726	3.962	0.16	0.18	2.16	78	-0.68	1.80	78	-4.4	102	0.090	95	97	6.1	-0.1	328	158	164	140	105	179	1358	416	82	46	86	45	74	0.051	14.87	1.55
24	3.888	4.136	0.16	0.17	2.30	78	-0.44	1.78	78	-4.3	102	0.090	95	97	6.0	-0.2	321	159	165	147	107	180	1301	420	82	46	85	45	74	0.051	14.81	1.26
25	4.053	4.310	0.17	0.17	2.27	78	-0.45	1.77	78	-4.5	101	0.090	97	97	5.8	-0.2	317	160	166	154	110	181	1252	411	82	46	85	45	74	0.050	14.02	0.67
26	4.217	4.482	0.16	0.17	2.27	78	-0.48	1.78	78	-4.4	101	0.090	96	96	5.7	-0.1	313	161	168	160	112	183	1227	407	83	46	85	45	74	0.050	13.17	0.32
27	4.382	4.655	0.17	0.17	2.21	78	-1.02	1.76	78	-4.5	101	0.090	97	96	5.6	-0.2	310	161	169	164	115	184	1259	409	83	46	85	45	75	0.051	12.37	0.19
28	4.544	4.828	0.16	0.17	2.31	78	-0.87	1.75	78	-4.5	102	0.090	95	96	5.4	-0.2	308	162	171	169	117	185	1275	416	83	47	85	45	74	0.052	12.1	0.25
29	4.704	4.998	0.16	0.17	2.25	78	-0.8	1.75	78	-4.5	102	0.080	100	100	5.2	-0.2	309	165	176	176	122	190	1277	421	84	47	86	45	74	0.052	12.31	0.32
30	4.875	5.171	0.17	0.17	2.25	78	-0.8	1.75	78	-4.5	102	0.080	107	102	5.2	-0.1	310	166	179	179	125	192	1229	421	84	47	86	45	75	0.051	12	0.36
31	5.036	5.342	0.16	0.17	2.14	78	-1.22	1.73	78	-4.6	103	0.090	95	95	5.0	-0.2	310	166	179	179	125	192	1229	421	84	47	86	45	75	0.051	12	0.36
32	5.196	5.513	0.16	0.17	2.11	78	-0.78	1.72	78	-4.5	102	0.090	94	95	4.9	-0.1	310	167	182	182	127	194	1196	420	84	47	86	45	75	0.051	11.55	0.38
33	5.354	5.683	0.16	0.17	2.04	78	-0.77	1.71	78	-4.6	102	0.080	99	100	4.7	-0.2	311	168	184	184	130	195	1167	416	84	47	86	45	75	0.051	11.08	0.41
34	5.517	5.854	0.16	0.17	2.20	78	-1.64	1.74	78	-4.6	102	0.090	96	95	4.7	-0.1	313	170	188	187	133	198	1143	408	84	48	86	45	75	0.050	10.45	0.47
35	5.678	6.025	0.16	0.17	2.14	79	-1.69	1.73	78	-4.7	102	0.090	95	95	4.5	-0.1	316	171	191	188	136	200	1129	408	85	48	86	45	74	0.049	10.26	0.48
36	5.839	6.197	0.16	0.17	2.11	79	-1.85	1.75	78	-5.2	102	0.090	95	96	4.5	-0.1	320	173	193	190	139	203	1138	406	84	48	86	45	75	0.050	10.28	0.44

Wood Heater Test Data

Run: 1

Manufacturer: Hearth & Home
Model: Dauntless NC
Tracking No.: 2389
Project No.: 061WS104E
Test Date: 04-Oct-19
Beginning Clock Time: 10:52

Total Sampling Time: 156 min
Recording Interval: 1 min
Background Sample Volume: _____ cubic feet

Meter Box Y Factor: 0.992 (1) 0.989 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	29.52		29.6	29.56 0

OMNI Equipment Numbers: _____

PM Control Modules: 371, 372
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.284 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 19.53 ft/sec.
Initial Tunnel Flow: 212.8 acfm
Average Tunnel Flow: 205.4 scfm
Post-Test Leak Check (1): 0.000 cfm @ 12 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ 11 in. Hg
Average Test Piece Fuel Moisture: 19.36 Dry Basis %

Technician Signature: _____

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.076	0.084	0.084	0.074	0.074	0.084	0.086	0.076	0.086	"H2O
Temp:	77	77	77	77	77	77	77	77	77	°F

V_{straw} 19.08 ft/sec V_{scent} 19.74 ft/sec F_p 0.967

	Particulate Sampling Data													Fuel Weight (lb)		Temperature Data (°F)										Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst Exit	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
37	6.003	6.367	0.16	0.17	2.30	79	-5.49	1.76	78	-7.5	102	0.090	96	95	4.3	-0.2	324	174	197	191	142	206	1139	408	84	48	86	45	75	-0.050	10.42	0.4
38	6.169	6.538	0.17	0.17	2.57	79	-6.92	1.82	78	-9.5	103	0.080	104	101	4.2	-0.1	328	176	201	192	145	208	1156	412	84	48	86	45	75	-0.050	10.85	0.43
39	6.337	6.711	0.17	0.17	2.25	79	-7	1.75	78	-10.2	103	0.090	99	96	4.1	-0.1	335	178	205	193	148	212	1164	415	84	49	86	45	75	-0.050	11.08	0.43
40	6.501	6.881	0.16	0.17	2.28	79	-7.54	1.75	78	-10.9	103	0.090	96	95	3.9	-0.1	343	180	210	195	152	216	1127	413	84	49	86	45	74	-0.050	11.45	0.41
41	6.661	7.049	0.16	0.17	2.06	79	-7.93	1.61	78	-11.3	103	0.090	94	93	3.9	-0.1	349	182	216	196	155	220	1172	418	84	49	86	45	74	-0.051	11.49	0.39
42	6.818	7.211	0.16	0.16	2.25	79	-8.72	1.85	78	-3.5	103	0.090	92	90	3.7	-0.2	355	184	220	197	158	223	1132	416	84	49	85	45	75	-0.050	11.3	0.49
43	6.984	7.384	0.17	0.17	2.27	79	-8.71	1.77	78	-3.2	103	0.090	98	96	3.7	0.0	358	187	225	199	162	226	1135	414	84	48	86	45	75	-0.050	11.09	0.52
44	7.152	7.558	0.17	0.17	2.34	79	-10.77	1.78	78	-3.4	103	0.090	99	97	3.5	-0.1	361	188	228	199	165	228	1152	417	83	48	86	45	75	-0.050	10.43	0.48
45	7.318	7.731	0.17	0.17	2.34	79	-10.64	1.79	78	-3.4	103	0.090	98	96	3.4	-0.2	366	191	233	199	168	231	1074	412	83	49	86	45	75	-0.049	10.48	0.47
46	7.492	7.905	0.17	0.17	2.40	79	-8.61	1.79	78	-3.5	103	0.080	109	103	3.3	-0.1	370	193	238	200	172	235	994	401	83	49	86	46	75	-0.048	10.06	0.54
47	7.655	8.078	0.16	0.17	2.20	79	-8.33	1.78	78	-3.4	102	0.090	96	96	3.2	-0.1	375	195	243	199	175	237	1029	395	83	49	85	45	75	-0.047	9.08	0.7
48	7.816	8.252	0.16	0.17	2.17	79	-9.74	1.78	78	-3.2	103	0.080	100	103	3.2	-0.1	381	197	247	198	177	240	1035	392	82	49	85	45	75	-0.047	8.52	0.79
49	7.985	8.425	0.17	0.17	2.32	79	-8.69	1.79	78	-3.2	102	0.080	105	102	3.0	-0.1	390	199	253	197	181	244	1005	388	82	49	85	46	75	-0.046	9.18	0.67
50	8.153	8.599	0.17	0.17	2.31	79	-8.41	1.79	78	-3.2	102	0.080	105	103	3.0	-0.1	399	202	257	196	184	248	981	382	82	49	85	45	76	-0.046	9.27	0.64
51	8.321	8.772	0.17	0.17	2.43	79	-7.96	1.78	78	-3.3	102	0.090	99	96	2.9	0.0	407	204	262	194	187	251	979	377	83	49	85	46	75	-0.045	9.03	0.66
52	8.489	8.946	0.17	0.17	2.32	79	-7.8	1.78	78	-3.2	102	0.080	105	103	2.8	-0.1	415	207	267	193	190	254	943	373	83	49	85	46	75	-0.044	8.99	0.65
53	8.654	9.119	0.16	0.17	2.20	79	-8.21	1.78	78	-3.2	101	0.090	97	96	2.8	0.0	421	210	271	191	193	257	896	366	83	49	86	46	75	-0.043	8.77	0.63
54	8.816	9.293	0.16	0.17	2.27	79	-9	1.77	78	-3.2	101	0.090	95	97	2.7	-0.1	426	212	275	189	196	260	869	362	83	49	86	46	75	-0.042	8.12	0.67
55	8.986	9.466	0.17	0.17	2.60	79	-9.23	1.76	78	-3.2	135	0.080	109	105	18.7	16.0	423	215	279	185	199	260	1085	300	84	49	87	46	76	-0.032	7.69	0.67
56	9.155	9.639	0.17	0.17	2.37	79	-6.2	1.76	78	-3.2	104	0.080	106	102	18.6	-0.2	405	216	280	186	203	258	1346	357	84	49	87	46	75	-0.047	6.16	0.52
57	9.318	9.812	0.16	0.17	2.21	79	-6.29	1.78	78	-3.4	103	0.090	96	96	18.4	-0.2	390	216	280	188	206	256	1468	387	84	49	87	46	75	-0.050	7.83	0.18
58	9.481	9.985	0.16	0.17	2.32	79	-8.45	1.77	78	-3.3	103	0.090	96	96	18.3	-0.1	378	216	279	193	209	255	1504	408	85	49	87	46	75	-0.052	12.57	0.08
59	9.647	10.158	0.17	0.17	2.31	80	-8.45	1.77	79	-3.5	104	0.080	103	102	18.1	-0.2	367	216	278	199	213	255	1544	426	85	49	87	46	75	-0.053	14.18	0.08
60	9.809	10.331	0.16	0.17	2.19	80	-11.52	1.77	79	-3.3	105	0.080	101	102	18.0	-0.1	356	215	277	203	216	253	1608	443	85	49	87	46	75	-0.056	14.96	0.1
61	9.959	10.504	0.15	0.17	3.27	80	0.17	1.82	79	-3.3	106	0.090	88	96	17.7	-0.2	346	214	275	206	218	252	1632	451	82	49	87	48	76	-0.056	15.34	0.22
62	10.129	10.679	0.17	0.18	2.07	80	0.12	1.78	79	-3.3	107	0.090	100	98	17.5	-0.2	338	214	273	211	221	251	1637	461	81	50	87	47	77	-0.057	15.82	0.93
63	10.292	10.853	0.16	0.17	2.26	80	0.31	1.78	79	-3.5	107	0.090	96	97	17.4	-0.1	330	213	271	215	224	251	1642	469	80	50	87	47	76	-0.058	15.87	1.54
64	10.456	11.026	0.16	0.17	2.25	80	-0.04	1.78	79	-3.4	108	0.080	103	102	17.2	-0.2	324	212	269	221	226	250	1632	474	78	50	87	47	75	-0.059	15.95	1.49
65	10.620	11.199	0.16	0.17	2.24	80	0.41	1.78	79	-3.5	109	0.090	97	97	17.0	-0.2	318	211	267	226	228	250	1657	482	77	50	87	47	76	-0.060	15.88	2.12
66	10.784	11.373	0.16	0.17	2.24	80	0.2	1.77	79	-3.3	109	0.090	97	97	16.8	-0.2	314	210	265	231	231	250	1669	487	76	50	87	47	76	-0.060	15.83	2.68
67	10.947	11.546	0.16	0.17	2.24	80	0.44	1.77	79	-3.5	110	0.080	102	103	16.6	-0.2	312	210	263	237	232	251	1676	491	75	50	86	47	76	-0.061	16.02	2.45
68	11.111	11.720	0.16	0.17	2.23	80	-0.03	1.77	79	-3.3	111	0.080	103	103	16.3	-0.2	308	209	261	242	234	251	1682	494	74	50	86	48	76	-0.061	16.13	2.35
69	11.274	11.893	0.16	0.17	2.21	80	-0.05	1.78	79	-3.4	111	0.080	102	103	16.1	-0.2	306	208	260	246	236	251	1681	499	73	50	86	48	75	-0.062	16.03	2.79
70	11.437	12.066	0.16	0.17	2.22	80	0.07	1.78	79	-3.3	112	0.090	96	97	16.0	-0.2	305	207	258	251	239	252	1682	503	74	50	86	48	76	-0.062	16.05	2.89
71	11.600	12.239	0.16	0.17	2.22	80	0.4	1.77	79	-3.3	113	0.090	97	97	15.8	-0.2	305	207	256	255	240	253	1684	508	74	50	86	48	76	-0.062	16.07	2.94
72	11.764	12.412	0.16	0.17	2.20	80	0.41	1.77	79	-3.4	113	0.080	103	103	15.5	-0.3	304	207	254	259	243	253	1689	511	87	50	86	48	76	-0.063	16.16	2.77
73	11.928	12.585	0.16	0.17	2.23	80	0.23	1.77	79	-3.3	114	0.090	97	97	15.3	-0.2	304	206	254	263	246	255	1694	511	87	50	86	48	76	-0.063	16.17	2.78

Wood Heater Test Data

Run: 1

Manufacturer: Hearth & Home
Model: Dauntless NC
Tracking No.: 2389
Project No.: 061WS104E
Test Date: 04-Oct-19
Beginning Clock Time: 10:52

Total Sampling Time: 156 min
Recording Interval: 1 min
Background Sample Volume: _____ cubic feet

Meter Box Y Factor: 0.992 (1) 0.989 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	29.52		29.6	29.56 0

OMNI Equipment Numbers: _____

PM Control Modules: 371, 372
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.284 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 19.53 ft/sec.
Initial Tunnel Flow: 212.8 acfm
Average Tunnel Flow: 205.4 scfm
Post-Test Leak Check (1): 0.000 cfm @ 12 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ 11 in. Hg
Average Test Piece Fuel Moisture: 19.36 Dry Basis %

Technician Signature: _____

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.076	0.084	0.084	0.074	0.074	0.084	0.086	0.076	0.086	"H2O
Temp:	77	77	77	77	77	77	77	77	77	°F

V_{straw} 19.08 ft/sec V_{scent} 19.74 ft/sec F_p 0.967

	Particulate Sampling Data													Fuel Weight (lb)		Temperature Data (°F)											Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst Exit	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
74	12.091	12.758	0.16	0.17	2.21	80	0.23	1.76	79	-3.5	114	0.080	102	103	15.1	-0.2	303	206	252	266	248	255	1698	513	86	50	86	48	76	-0.063	15.99	3.27
75	12.254	12.931	0.16	0.17	2.22	80	0.4	1.76	79	-3.5	113	0.080	102	103	14.9	-0.2	302	205	251	270	252	256	1714	514	86	50	86	48	76	-0.063	15.95	3.23
76	12.418	13.104	0.16	0.17	2.24	80	0.06	1.76	79	-3.5	114	0.080	103	103	14.7	-0.2	300	205	250	274	255	257	1681	511	86	50	86	48	76	-0.063	16.16	2.68
77	12.582	13.277	0.16	0.17	2.23	80	0.37	1.78	79	-3.4	113	0.080	103	103	14.5	-0.2	298	205	249	276	260	258	1688	509	86	51	86	49	76	-0.062	16.08	2.76
78	12.745	13.450	0.16	0.17	2.21	80	-0.05	1.77	79	-3.4	114	0.080	102	103	14.3	-0.2	298	205	249	278	263	259	1691	508	86	51	86	49	76	-0.063	15.81	3.45
79	12.908	13.622	0.16	0.17	2.27	80	0.28	1.77	79	-3.6	114	0.080	102	102	14.1	-0.2	297	204	247	279	268	259	1698	509	85	51	87	49	76	-0.063	15.82	3.34
80	13.073	13.795	0.17	0.17	2.24	80	0.15	1.76	79	-3.5	115	0.090	98	97	13.9	-0.2	297	205	247	280	271	260	1703	512	85	51	87	49	76	-0.063	15.89	3.11
81	13.237	13.969	0.16	0.17	2.23	80	0	1.80	79	-3.5	114	0.080	103	104	13.7	-0.2	296	205	246	282	275	261	1718	514	85	51	87	49	76	-0.063	15.95	2.98
82	13.401	14.143	0.16	0.17	2.25	80	0.4	1.79	79	-3.7	115	0.090	97	98	13.5	-0.2	298	205	246	284	279	262	1704	515	85	51	87	49	76	-0.063	16.04	2.81
83	13.565	14.317	0.16	0.17	2.24	80	-0.13	1.79	79	-3.5	116	0.090	97	98	13.3	-0.2	303	205	247	286	282	265	1704	517	85	51	88	49	76	-0.063	16.22	2.42
84	13.730	14.491	0.17	0.17	2.24	80	0.31	1.79	79	-3.5	116	0.090	98	98	13.1	-0.2	308	206	248	289	287	268	1700	518	85	51	88	49	76	-0.063	16.32	2.25
85	13.893	14.665	0.16	0.17	2.24	80	0.06	1.79	79	-3.6	116	0.080	103	104	12.9	-0.2	315	207	251	290	290	271	1700	519	85	51	88	49	76	-0.063	16.41	2.07
86	14.057	14.839	0.16	0.17	2.25	81	-0.12	1.78	79	-3.4	116	0.090	97	98	12.7	-0.2	318	208	253	291	294	273	1703	518	84	51	88	49	76	-0.063	16.55	1.83
87	14.221	15.013	0.16	0.17	2.24	81	0.31	1.79	79	-3.6	116	0.090	97	98	12.6	-0.1	321	209	254	293	297	275	1705	520	84	51	88	49	77	-0.063	16.56	1.4
88	14.385	15.187	0.16	0.17	2.22	81	-0.13	1.80	79	-3.6	116	0.090	97	98	12.4	-0.2	324	210	256	295	300	277	1713	522	84	51	88	49	77	-0.063	16.55	1.43
89	14.548	15.361	0.16	0.17	2.24	81	0.27	1.79	79	-3.4	117	0.080	103	104	12.1	-0.2	326	211	257	298	304	279	1724	523	84	51	88	49	76	-0.063	16.56	1.34
90	14.712	15.535	0.16	0.17	2.23	81	0.36	1.79	79	-3.7	117	0.080	103	104	11.9	-0.2	326	212	259	299	307	281	1725	526	84	51	88	49	76	-0.064	16.61	1.43
91	14.875	15.709	0.16	0.17	2.21	81	0.41	1.78	79	-3.6	117	0.080	103	104	11.7	-0.2	331	213	260	301	310	283	1723	528	84	52	88	49	77	-0.064	16.61	1.65
92	15.038	15.882	0.16	0.17	2.25	81	0.36	1.79	79	-3.6	118	0.080	103	103	11.5	-0.2	337	214	262	302	313	286	1718	527	84	52	88	50	77	-0.064	16.6	1.86
93	15.203	16.057	0.16	0.17	2.25	81	-0.08	1.79	79	-3.6	118	0.080	104	104	11.4	-0.2	345	215	265	304	316	289	1716	527	84	52	88	50	77	-0.065	16.6	1.88
94	15.367	16.230	0.16	0.17	2.22	81	0.06	1.78	79	-3.5	117	0.080	103	103	11.2	-0.2	355	217	268	304	319	293	1712	526	83	52	88	50	77	-0.064	16.51	2.14
95	15.530	16.405	0.16	0.18	2.23	81	0.34	1.79	79	-3.5	118	0.080	103	104	11.0	-0.2	364	218	271	306	323	296	1714	527	83	52	88	50	77	-0.064	16.52	2.16
96	15.694	16.578	0.16	0.17	2.24	81	0.39	1.80	79	-3.6	117	0.090	97	97	10.9	-0.1	370	220	276	306	326	300	1712	522	83	52	87	50	77	-0.063	16.57	2.06
97	15.858	16.752	0.16	0.17	2.23	81	0.24	1.78	79	-3.4	117	0.080	103	104	10.6	-0.2	374	222	280	307	327	302	1699	520	83	52	87	50	77	-0.063	16.69	1.2
98	16.024	16.926	0.17	0.17	2.32	81	-0.2	1.78	80	-3.6	117	0.090	98	98	10.4	-0.2	382	223	284	307	330	305	1688	526	83	52	87	50	77	-0.064	16.66	0.62
99	16.189	17.100	0.16	0.17	2.27	81	-0.05	1.79	80	-3.6	118	0.080	104	104	10.3	-0.1	392	225	289	309	332	309	1684	524	83	52	87	50	77	-0.063	16.55	0.96
100	16.353	17.274	0.16	0.17	2.28	81	0.03	1.79	80	-3.7	118	0.090	97	98	10.2	-0.2	400	227	294	309	336	313	1679	524	83	52	87	50	77	-0.064	16.52	1.32
101	16.519	17.448	0.17	0.17	2.26	81	0.01	1.79	80	-3.4	118	0.090	99	98	10.0	-0.2	408	229	299	310	337	317	1676	524	84	52	87	50	77	-0.063	16.57	1.3
102	16.683	17.622	0.16	0.17	2.26	81	0.38	1.78	80	-3.4	118	0.090	97	98	9.8	-0.2	416	231	304	311	339	320	1674	524	84	52	87	50	77	-0.063	16.6	1.27
103	16.848	17.796	0.16	0.17	2.26	81	0.16	1.80	80	-3.6	118	0.090	98	98	9.6	-0.2	423	233	309	312	342	324	1679	526	84	52	87	50	78	-0.063	16.6	1.36
104	17.013	17.970	0.17	0.17	2.23	81	-0.14	1.79	80	-3.4	119	0.080	104	104	9.4	-0.2	429	235	314	312	343	327	1677	527	85	52	87	50	77	-0.064	16.63	1.39
105	17.177	18.143	0.16	0.17	2.23	81	-0.16	1.78	80	-3.4	119	0.080	103	103	9.2	-0.2	435	237	317	312	346	329	1665	529	85	52	87	50	78	-0.064	16.69	1.48
106	17.341	18.318	0.16	0.18	2.24	81	0.27	1.78	80	-3.5	119	0.080	103	104	9.1	-0.2	443	239	321	313	348	333	1653	531	85	52	87	50	77	-0.063	16.68	1.87
107	17.505	18.491	0.16	0.17	2.24	81	-0.18	1.79	80	-3.5	120	0.080	103	103	8.9	-0.1	451	241	326	313	349	336	1635	531	85	52	87	50	78	-0.064	16.67	1.95
108	17.669	18.665	0.16	0.17	2.24	81	0.34	1.79	80	-3.5	120	0.090	98	98	8.7	-0.2	457	243	330	313	351	339	1625	529	86	52	87	50	77	-0.064	16.66	1.54
109	17.833	18.839	0.16	0.17	2.23	81	0.34	1.78	80	-3.4	120	0.080	103	104	8.5	-0.2	463	245	334	313	352	341	1637	527	86	53	86	50	78	-0.063	16.55	1.16
110	17.996	19.013	0.16	0.17	2.28	82	0.32	1.79	80	-3.4	120	0.090	97	98	8.3	-0.2	468	247	339	313	353	344	1626	527	86	53	86	50	77	0.063	16.71	0.86

Wood Heater Test Data

Run: 1

Manufacturer: Hearth & Home
Model: Dauntless NC
Tracking No.: 2389
Project No.: 061WS104E
Test Date: 04-Oct-19
Beginning Clock Time: 10:52

Total Sampling Time: 156 min
Recording Interval: 1 min
Background Sample Volume: _____ cubic feet

Meter Box Y Factor: 0.992 (1) 0.989 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	29.52		29.6	29.56 0

OMNI Equipment Numbers: _____

PM Control Modules: 371, 372
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.284 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 19.53 ft/sec.
Initial Tunnel Flow: 212.8 acfm
Average Tunnel Flow: 205.4 scfm
Post-Test Leak Check (1): 0.000 cfm @ 12 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ 11 in. Hg
Average Test Piece Fuel Moisture: 19.36 Dry Basis %

Technician Signature: _____

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.076	0.084	0.084	0.074	0.074	0.084	0.086	0.076	0.086	"H2O
Temp:	77	77	77	77	77	77	77	77	77	°F

V_{straw} 19.08 ft/sec V_{scent} 19.74 ft/sec F_p 0.967

	Particulate Sampling Data													Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst Exit	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
111	18.162	19.187	0.17	0.17	2.28	82	-0.08	1.79	80	-3.6	120	0.090	99	98	8.1	-0.2	477	250	343	313	354	347	1613	530	86	53	86	50	77	-0.064	16.83	0.92
112	18.327	19.360	0.17	0.17	2.25	82	-0.01	1.78	80	-3.7	119	0.090	98	97	8.0	-0.2	487	253	349	313	356	352	1605	528	86	53	86	50	78	-0.063	16.67	1.11
113	18.492	19.534	0.16	0.17	2.27	82	0.34	1.78	80	-3.6	120	0.080	104	104	7.8	-0.2	489	255	354	313	357	354	1617	526	86	53	86	50	78	-0.063	16.58	1.02
114	18.657	19.708	0.16	0.17	2.27	82	-0.14	1.80	80	-3.6	120	0.080	104	104	7.7	-0.1	492	257	357	312	358	355	1616	521	86	53	86	50	78	-0.062	16.63	0.79
115	18.822	19.882	0.16	0.17	2.27	82	-0.03	1.79	80	-3.7	120	0.090	98	98	7.5	-0.2	495	260	361	312	359	357	1646	523	86	53	86	50	78	-0.063	16.51	0.55
116	18.987	20.056	0.16	0.17	2.24	82	0.13	1.78	80	-3.4	120	0.080	104	104	7.4	-0.1	494	262	364	312	361	359	1654	524	86	53	86	51	79	-0.062	16.52	0.5
117	19.151	20.230	0.16	0.17	2.26	82	-0.07	1.77	80	-3.7	120	0.080	103	104	7.2	-0.2	495	264	368	312	362	360	1663	526	86	53	86	51	78	-0.063	16.7	0.81
118	19.317	20.404	0.17	0.17	2.27	82	0.34	1.79	80	-3.4	119	0.090	98	98	7.0	-0.2	495	266	371	313	364	362	1654	528	86	53	86	51	78	-0.063	16.81	0.92
119	19.482	20.578	0.16	0.17	2.26	82	0.1	1.79	80	-3.7	120	0.090	98	98	6.8	-0.2	495	268	373	313	366	363	1648	528	86	53	86	51	78	-0.062	16.83	0.92
120	19.647	20.752	0.16	0.17	2.24	82	-0.2	1.77	80	-3.7	120	0.090	98	98	6.6	-0.2	498	271	376	313	367	365	1647	527	86	53	86	51	79	-0.063	16.81	0.89
121	19.811	20.925	0.16	0.17	2.25	82	0.06	1.78	80	-3.5	120	0.090	97	97	6.5	-0.2	499	273	379	313	369	367	1642	526	85	53	87	51	79	-0.062	16.77	0.8
122	19.975	21.099	0.16	0.17	2.27	82	0.09	1.79	80	-3.4	120	0.090	97	98	6.3	-0.2	502	275	382	313	370	368	1644	525	85	53	87	51	79	-0.063	16.77	0.84
123	20.141	21.273	0.17	0.17	2.26	82	0.22	1.79	80	-3.7	121	0.090	99	98	6.2	-0.1	505	278	384	314	372	371	1654	525	85	53	87	51	79	-0.062	16.81	0.72
124	20.306	21.447	0.17	0.17	2.24	82	0.29	1.79	80	-3.6	120	0.080	104	104	6.0	-0.2	509	280	389	314	373	373	1660	529	85	53	88	51	78	-0.063	16.86	0.72
125	20.470	21.621	0.16	0.17	2.26	82	-0.15	1.79	80	-3.6	120	0.080	103	104	5.9	-0.2	511	283	392	314	373	375	1645	526	85	53	88	51	79	-0.062	16.94	0.86
126	20.635	21.795	0.17	0.17	2.27	82	-0.09	1.79	80	-3.6	120	0.080	104	104	5.7	-0.2	511	285	394	315	374	376	1652	522	85	53	88	51	79	-0.062	16.96	0.75
127	20.799	21.969	0.16	0.17	2.25	82	-0.1	1.78	80	-3.4	120	0.080	103	104	5.5	-0.2	512	287	397	315	376	377	1662	522	85	53	88	51	79	-0.062	16.8	0.46
128	20.963	22.143	0.16	0.17	2.25	82	-0.11	1.79	80	-3.7	120	0.080	103	104	5.4	-0.2	513	290	399	316	378	379	1667	521	85	53	88	51	79	-0.062	16.78	0.43
129	21.128	22.317	0.16	0.17	2.26	82	0.04	1.79	80	-3.7	120	0.090	98	98	5.3	-0.1	515	292	401	315	378	380	1662	517	85	53	88	51	79	-0.061	16.83	0.42
130	21.293	22.491	0.16	0.17	2.25	82	0.19	1.79	80	-3.7	120	0.080	104	104	5.1	-0.2	515	294	403	315	378	381	1669	516	85	53	88	51	79	-0.061	16.76	0.37
131	21.457	22.665	0.16	0.17	2.23	82	0.14	1.79	80	-3.7	119	0.090	97	98	4.9	-0.2	516	296	405	316	379	382	1675	514	85	53	88	51	79	-0.061	16.65	0.32
132	21.621	22.839	0.16	0.17	2.24	83	0	1.80	80	-3.7	120	0.080	103	104	4.8	-0.1	517	299	407	315	379	383	1674	514	84	53	88	51	79	-0.061	16.59	0.27
133	21.785	23.013	0.16	0.17	2.25	83	0.32	1.79	80	-3.6	120	0.090	97	98	4.7	-0.1	518	301	408	316	380	385	1675	513	84	53	88	51	79	-0.061	16.58	0.27
134	21.950	23.186	0.16	0.17	2.24	83	-0.19	1.79	80	-3.6	119	0.080	104	103	4.6	-0.2	519	303	411	315	382	386	1678	514	84	53	88	51	79	-0.061	16.55	0.23
135	22.114	23.361	0.16	0.18	2.24	83	0.2	1.79	80	-3.4	120	0.090	97	98	4.4	-0.2	521	305	412	315	382	387	1663	517	84	53	88	51	79	-0.062	16.55	0.25
136	22.278	23.535	0.16	0.17	2.25	83	0.16	1.79	80	-3.7	120	0.080	103	104	4.2	-0.1	524	308	414	316	384	389	1657	519	84	53	88	51	80	-0.061	16.55	0.27
137	22.442	23.709	0.16	0.17	2.25	83	-0.18	1.78	80	-3.5	119	0.080	103	104	4.1	-0.2	526	310	416	316	382	390	1643	517	84	53	88	51	79	-0.061	16.61	0.35
138	22.606	23.883	0.16	0.17	2.22	83	0.29	1.78	80	-3.5	120	0.090	97	98	4.0	-0.1	528	312	418	316	384	392	1621	512	84	53	88	51	80	-0.061	16.43	0.23
139	22.770	24.056	0.16	0.17	2.24	83	0.07	1.78	80	-3.6	119	0.080	103	103	3.8	-0.2	529	315	420	315	384	393	1618	509	84	53	88	51	79	-0.060	16.05	0.13
140	22.934	24.230	0.16	0.17	2.23	83	-0.15	1.78	80	-3.4	120	0.080	103	104	3.6	-0.2	537	317	422	314	384	395	1604	519	84	53	88	51	79	-0.062	15.75	0.09
141	23.098	24.404	0.16	0.17	2.21	83	0.19	1.79	80	-3.4	121	0.080	103	104	3.5	-0.2	554	320	426	314	385	400	1559	517	84	53	88	51	79	-0.061	15.69	0.17
142	23.261	24.578	0.16	0.17	2.22	83	0.31	1.79	80	-3.4	120	0.080	102	104	3.3	-0.2	564	323	429	314	386	403	1541	510	84	53	88	51	80	-0.061	16.02	0.34
143	23.425	24.752	0.16	0.17	2.25	83	0.12	1.79	80	-3.5	119	0.080	103	104	3.3	-0.1	570	328	432	312	384	405	1520	502	84	53	88	51	80	-0.059	15.66	0.2
144	23.590	24.926	0.16	0.17	2.22	83	-0.18	1.78	80	-3.6	119	0.090	98	98	3.1	-0.2	573	331	434	309	384	406	1506	498	83	53	87	51	81	-0.059	15.31	0.08
145	23.755	25.100	0.16	0.17	2.29	83	-0.07	1.79	80	-3.6	119	0.080	104	104	3.0	-0.1	574	335	435	307	382	407	1503	492	83	53	87	51	80	-0.058	14.96	0.03
146	23.920	25.275	0.17	0.17	2.27	83	0.28	1.78	80	-3.6	118	0.090	98	98	2.9	-0.1	573	338	437	305	382	407	1492	489	83	53	87	51	81	-0.058	14.64	0.02
147	24.085	25.448	0.16	0.17	2.28	83	-0.08	1.80	80	-3.5	118	0.080	104	103	2.7	-0.2	571	340	437	302	381	406	1476	487	83	53	87	51	80	-0.058	14.28	0.01

Wood Heater Test Data

Run: 1

Manufacturer: Hearth & Home
Model: Dauntless NC
Tracking No.: 2389
Project No.: 061WS104E
Test Date: 04-Oct-19
Beginning Clock Time: 10:52

Total Sampling Time: 156 min
Recording Interval: 1 min
Background Sample Volume: _____ cubic feet

Meter Box Y Factor: 0.992 (1) 0.989 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	29.52		29.6	29.56 0

OMNI Equipment Numbers: _____

PM Control Modules: 371, 372
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.284 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 19.53 ft/sec.
Initial Tunnel Flow: 212.8 acfm
Average Tunnel Flow: 205.4 scfm
Post-Test Leak Check (1): 0.000 cfm @ 12 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ 11 in. Hg
Average Test Piece Fuel Moisture: 19.36 Dry Basis %

Technician Signature: _____

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.076	0.084	0.084	0.074	0.074	0.084	0.086	0.076	0.086	"H2O
Temp:	77	77	77	77	77	77	77	77	77	°F

V_{straw} 19.08 ft/sec V_{scent} 19.74 ft/sec F_p 0.967

	Particulate Sampling Data													Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft³)	Gas Meter 2 (ft³)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst Exit	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H2O)	CO_2 (%)	CO (%)
148	24.251	25.623	0.17	0.18	2.28	83	0.14	1.79	80	-3.7	118	0.080	104	104	2.7	-0.1	570	343	439	299	380	406	1456	484	83	53	87	51	81	-0.057	13.94	0.01
149	24.416	25.797	0.16	0.17	2.26	83	0.27	1.79	80	-3.6	117	0.090	98	98	2.5	-0.1	570	345	440	296	380	406	1437	482	83	53	87	51	80	-0.057	13.56	0.01
150	24.582	25.971	0.17	0.17	2.27	83	0.26	1.80	80	-3.7	117	0.080	104	104	2.5	0.0	569	346	441	293	380	406	1417	479	83	53	87	51	81	-0.057	13.3	0.01
151	24.747	26.146	0.16	0.18	2.28	83	0.1	1.79	80	-3.5	117	0.080	103	104	2.3	-0.2	570	348	443	290	380	406	1417	477	83	53	87	51	81	-0.057	13.08	0.02
152	24.913	26.319	0.17	0.17	2.27	83	0.28	1.79	80	-3.6	117	0.080	104	103	2.2	-0.1	571	349	444	288	379	406	1402	475	83	53	87	51	81	-0.056	13.01	0.03
153	25.078	26.494	0.16	0.18	2.28	83	-0.22	1.79	80	-3.6	117	0.080	103	104	2.1	-0.1	571	351	446	286	379	407	1386	472	83	53	87	51	81	-0.056	12.92	0.05
154	25.243	26.668	0.16	0.17	2.27	83	0.3	1.79	81	-3.4	117	0.080	103	103	2.0	-0.1	571	352	447	285	379	407	1363	470	83	53	86	51	81	-0.056	12.7	0.06
155	25.409	26.842	0.17	0.17	2.28	83	0.06	1.79	80	-3.4	117	0.080	104	104	2.0	0.0	571	352	448	282	378	406	1354	465	83	53	86	51	81	-0.056	12.44	0.08
156	25.575	27.017	0.17	0.18	2.26	83	0.26	1.79	81	-3.4	116	0.080	104	104	1.8	-0.1	571	353	449	279	378	406	1362	463	83	53	86	51	81	-0.055	12.21	0.09
Avg/Tot	25.575	27.017	0.16	0.17	2.25	80		1.78	79		112	0.085	100	100								332.0				50	87	48	76	-0.056		

Wood Heater Lab Data

Manufacturer:	Hearth & Home	Equipment Numbers:	
Model:	Dauntless NC		
Tracking No.:	2389		
Project No.:	061WS104E		
Run #:	1		
Date:	10/4/19		

TRAIN 1 (First Hour emissions)

Sample Component	Reagent	Filter, Probe or Dish #	Weights		
			Final, mg	Tare, mg	Particulate, mg
B. Front filter catch	Filter	T183S	92.2	87.1	5.1
C. Rear filter catch	Filter				0.0
D. Probe catch*	Probe				0.0
E. Filter seals catch*	Seals				0.0

Sub-Total | Total Particulate, mg: | 5.1

TRAIN 1 (Post First Hour Change-out)

Sample Component	Reagent	Filter, Probe or Dish #	Weights		
			Final, mg	Tare, mg	Particulate, mg
B. Front filter catch	Filter	T203AP	180.1	179.6	0.5
C. Rear filter catch	Filter				0.0
D. Probe catch*	Probe	36	114883.8	114883.6	0.2
E. Filter seals catch*	Seals	R887	3487.9	3487.0	0.9

Sub-Total | Total Particulate, mg: | 1.6

Train 1 Aggregate | Total Particulate, mg: | **6.7**

TRAIN 2

Sample Component	Reagent	Filter, Probe or Dish #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Front filter catch	Filter	T203BP	183.7	180.0	3.7
B. Rear filter catch	Filter	T184S	90.9	87.5	3.4
C. Probe catch*	Probe	56	118613.7	118613.2	0.5
D. Filter seals catch*	Seals	R888	3334.2	3334.1	0.1

Total Particulate, mg: | **7.7**

AMBIENT

Sample Component	Reagent	Filter # or Probe #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Front filter catch*	Filter				0.0

Total Particulate, mg: | **0.0**

*Particulate catch that results in a negative number, is assumed to be zero for probes and seals, negative numbers for filters are assumed to be part of the seal weight.

Component	Equations:
A. Front filter catch	Final (mg) - Tare (mg) = Particulate, mg
B. Rear filter catch	Final (mg) - Tare (mg) = Particulate, mg
C. Probe catch	Final (mg) - Tare (mg) = Particulate, mg

Technician Signature: 

OMNI-Test Laboratories, Inc.

Wood Heater Test Results - ASTM E2780 / ASTM E2515

Manufacturer: Hearth & Home
Model: Dauntless NC
Project No.: 061WS104E
Tracking No.: 2389
Run: 1
Test Date: 10/04/19

Burn Rate	**3.31 kg/hr dry**
Average Tunnel Temperature	112 degrees Fahrenheit
Average Gas Velocity in Dilution Tunnel - vs	19.53 feet/second
Average Gas Flow Rate in Dilution Tunnel - Qsd	12324.4 dscf/hour
Average Delta p	0.085 inches H20
Total Time of Test	156 minutes

	AMBIENT	SAMPLE TRAIN 1	SAMPLE TRAIN 2	FIRST HOUR FILTER (TRAIN 1)
Total Sample Volume - Vm	0.000 cubic feet	25.575 cubic feet	27.017 cubic feet	9.809 cubic feet
Average Gas Meter Temperature	76 degrees Fahrenheit	80 degrees Fahrenheit	79 degrees Fahrenheit	78 degrees Fahrenheit
Total Sample Volume (Standard Conditions) - Vmstd	0.000 dscf	24.622 dscf	25.965 dscf	9.476 dscf
Total Particulates - m_n	0 mg	6.7 mg	7.7 mg	5.1 mg
Particulate Concentration (dry-standard) - C_r/C_s	0.000000 grams/dscf	0.00027 grams/dscf	0.00030 grams/dscf	0.00054 grams/dscf
Total Particulate Emissions - E_T	0.00 grams	8.72 grams	9.50 grams	6.63 grams
Particulate Emission Rate	0.00 grams/hour	3.35 grams/hour	3.65 grams/hour	6.63 grams/hour
Emissions Factor		1.01 g/kg	1.10 g/kg	-1.23 g/kg
Difference from Average Total Particulate Emissions		0.39 grams	0.39 grams	
		Dual Train Comparison Results Are Acceptable		

FINAL AVERAGE RESULTS	
Complete Test Run	
Total Particulate Emissions - E_T	9.11 grams
Particulate Emission Rate	**3.50 grams/hour**
Emissions Factor	1.06 grams/kg
First Hour Emissions	
Total Particulate Emissions - E_T	6.63 grams
Particulate Emission Rate	6.63 grams/hour
Emissions Factor	-1.23 grams/kg
7.5% of Average Total Particulate Emissions	0.68 grams

QUALITY CHECKS	
Filter Temps < 90 °F	OK
Filter Face Velocity (47 mm)	OK
Dryer Exit Temp < 80F	OK
Leakage Rate	OK
Ambient Temp (55-90°F)	OK
Negative Probe Weight Eval.	OK
Pro-Rate Variation	ECK 10 MIN. INTERVAL PRO-RAT
Train A - Train B G/KG ≤ 0.5	0.09
Total PM Precision (%)	4.30

Technician Signature: 

Run 1

High Burn 10-minute data

Efficiency and Heat Output Results
Kindling and start-up fuel removed from calculations

Wood Heater Test Data

Run: 1

Manufacturer: Hearth & Home
Model: Dauntless NC
Tracking No.: 2389
Project No.: 061WS104E
Test Date: 04-Oct-19
Beginning Clock Time:

Total Sampling Time: 101 min
Recording Interval: 1 min
Background Sample Volume: cubic feet

Meter Box Y Factor: 0.992 (1) 0.989 (2) (Amb)

Barometric Pressure: Begin 29.52 Middle End 29.6 Average 29.56

OMNI Equipment Numbers:

PM Control Modules: 371, 372
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.284 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: #DIV/0! ft/sec.
Initial Tunnel Flow: #DIV/0! scfm
Average Tunnel Flow: #DIV/0! scfm
Post-Test Leak Check (1): cfm @ in. Hg
Post-Test Leak Check (2): cfm @ in. Hg
Average Test Piece Fuel Moisture: 20.90 Dry Basis %

Technician Signature:

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP										"H2O
Temp:										"F

V_{stav} ft/sec V_{scent} ft/sec F_p

Elapsed Time (min)	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst Exit	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
0															17.0		423	215	279	185	199	260	1085	300	84	49	87	46	76	-0.032	7.69	0.67
1															16.8	-0.2	405	216	280	186	203	258	1346	357	84	49	87	46	75	-0.047	6.16	0.52
2															16.6	-0.2	390	216	280	188	206	256	1468	387	84	49	87	46	75	-0.050	7.83	0.18
3															16.5	-0.1	378	216	279	193	209	255	1504	408	85	49	87	46	75	-0.052	12.57	0.06
4															16.3	-0.2	367	216	278	199	213	255	1544	426	85	49	87	46	75	-0.053	14.18	0.08
5															16.2	-0.1	356	215	277	203	216	253	1608	443	85	49	87	46	75	-0.056	14.96	0.1
6															15.9	-0.2	346	214	275	206	218	252	1632	451	82	49	87	48	76	-0.056	15.34	0.22
7															15.7	-0.2	338	214	273	211	221	251	1637	461	81	50	87	47	77	-0.057	15.82	0.93
8															15.6	-0.1	330	213	271	215	224	251	1642	469	80	50	87	47	76	-0.058	15.87	1.54
9															15.4	-0.2	324	212	269	221	226	250	1632	474	78	50	87	47	75	-0.059	15.95	1.49
10															15.2	-0.2	318	211	267	226	228	250	1657	482	77	50	87	47	76	-0.060	15.88	2.12
11															15.0	-0.2	314	210	265	231	231	250	1669	487	76	50	87	47	76	-0.060	15.83	2.68
12															14.8	-0.2	312	210	263	237	232	251	1676	491	75	50	86	47	76	-0.061	16.02	2.45
13															14.5	-0.2	308	209	261	242	234	251	1682	494	74	50	86	48	76	-0.061	16.13	2.35
14															14.3	-0.2	306	208	260	246	236	251	1681	499	73	50	86	48	75	-0.062	16.03	2.79
15															14.2	-0.2	305	207	258	251	239	252	1682	503	74	50	86	48	76	-0.062	16.05	2.89
16															14.0	-0.2	305	207	256	255	240	253	1684	506	74	50	86	48	76	-0.062	16.07	2.94
17															13.7	-0.3	304	207	254	259	243	253	1689	511	87	50	86	48	76	-0.063	16.16	2.77
18															13.5	-0.2	304	206	254	263	246	255	1694	511	87	50	86	48	76	-0.063	16.17	2.78
19															13.3	-0.2	303	206	252	266	248	255	1698	513	86	50	86	48	76	-0.063	15.99	3.27
20															13.1	-0.2	302	205	251	270	252	256	1714	514	86	50	86	48	76	-0.063	15.95	3.23
21															12.9	-0.2	300	205	250	274	255	257	1681	511	86	50	86	48	76	-0.063	16.16	2.68
22															12.7	-0.2	298	205	249	276	260	258	1688	509	86	51	86	49	76	-0.062	16.08	2.76
23															12.5	-0.2	298	205	249	278	263	259	1691	508	86	51	86	49	76	-0.063	15.81	3.45
24															12.3	-0.2	297	204	247	279	268	259	1698	509	85	51	87	49	76	-0.063	15.82	3.34
25															12.1	-0.2	297	205	247	280	271	260	1703	512	85	51	87	49	76	-0.063	15.89	3.11
26															11.9	-0.2	296	205	246	282	275	261	1718	514	85	51	87	49	76	-0.063	15.95	2.98
27															11.7	-0.2	298	205	246	284	279	262	1704	515	85	51	87	49	76	-0.063	16.04	2.81
28															11.5	-0.2	303	205	247	286	282	265	1704	517	85	51	88	49	76	-0.063	16.22	2.42
29															11.3	-0.2	308	206	248	289	287	268	1700	518	85	51	88	49	76	-0.063	16.32	2.25
30															11.1	-0.2	315	207	251	290	290	271	1700	519	85	51	88	49	76	-0.063	16.41	2.07
31															10.9	-0.2	318	208	253	291	294	273	1703	518	84	51	88	49	76	-0.063	16.55	1.83
32															10.8	-0.1	321	209	254	293	297	275	1705	520	84	51	88	49	77	-0.063	16.56	1.4
33															10.6	-0.2	324	210	256	295	300	277	1713	522	84	51	88	49	77	-0.063	16.55	1.43
34															10.3	-0.2	326	211	257	298	304	279	1724	523	84	51	88	49	76	-0.063	16.56	1.34
35															10.1	-0.2	326	212	259	299	307	281	1725	526	84	51	88	49	76	-0.064	16.61	1.43

Wood Heater Test Data

Run: 1

Manufacturer: Hearth & Home
Model: Dauntless NC
Tracking No.: 2389
Project No.: 061WS104E
Test Date: 04-Oct-19
Beginning Clock Time:

Total Sampling Time: 101 min
Recording Interval: 1 min
Background Sample Volume: cubic feet

Meter Box Y Factor: 0.992 (1) 0.989 (2) (Amb)

Barometric Pressure: Begin 29.52 Middle End 29.6 Average 29.56 0

OMNI Equipment Numbers:

PM Control Modules: 371, 372
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.284 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: #DIV/0! ft/sec.
Initial Tunnel Flow: #DIV/0! scfm
Average Tunnel Flow: #DIV/0! scfm
Post-Test Leak Check (1): cfm @ in. Hg
Post-Test Leak Check (2): cfm @ in. Hg
Average Test Piece Fuel Moisture: 20.90 Dry Basis %

Technician Signature:

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP										"H2O
Temp:										°F

V_{stav} ft/sec V_{scent} ft/sec F_p

Elapsed Time (min)	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst Exit	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
36															9.9	-0.2	331	213	260	301	310	283	1723	528	84	52	88	49	77	-0.064	16.61	1.65
37															9.7	-0.2	337	214	262	302	313	286	1718	527	84	52	88	50	77	-0.064	16.6	1.86
38															9.6	-0.2	345	215	265	304	316	289	1716	527	84	52	88	50	77	-0.065	16.6	1.88
39															9.4	-0.2	355	217	268	304	319	293	1712	526	83	52	88	50	77	-0.064	16.51	2.14
40															9.2	-0.2	364	218	271	306	323	296	1714	527	83	52	88	50	77	-0.064	16.52	2.16
41															9.1	-0.1	370	220	276	306	326	300	1712	522	83	52	87	50	77	-0.063	16.57	2.06
42															8.8	-0.2	374	222	280	307	327	302	1699	520	83	52	87	50	77	-0.063	16.69	1.2
43															8.6	-0.2	382	223	284	307	330	305	1688	526	83	52	87	50	77	-0.064	16.66	0.62
44															8.5	-0.1	392	225	289	309	332	309	1684	524	83	52	87	50	77	-0.063	16.55	0.96
45															8.4	-0.2	400	227	294	309	336	313	1679	524	83	52	87	50	77	-0.064	16.52	1.32
46															8.2	-0.2	408	229	299	310	337	317	1676	524	84	52	87	50	77	-0.063	16.57	1.3
47															8.0	-0.2	416	231	304	311	339	320	1674	524	84	52	87	50	77	-0.063	16.6	1.27
48															7.8	-0.2	423	233	309	312	342	324	1679	526	84	52	87	50	78	-0.063	16.6	1.36
49															7.6	-0.2	429	235	314	312	343	327	1677	527	85	52	87	50	77	-0.064	16.63	1.39
50															7.4	-0.2	435	237	317	312	346	329	1665	529	85	52	87	50	78	-0.064	16.69	1.48
51															7.3	-0.2	443	239	321	313	348	333	1653	531	85	52	87	50	77	-0.063	16.68	1.87
52															7.1	-0.1	451	241	326	313	349	336	1635	531	85	52	87	50	78	-0.064	16.67	1.95
53															6.9	-0.2	457	243	330	313	351	339	1625	529	86	52	87	50	77	-0.064	16.66	1.54
54															6.7	-0.2	463	245	334	313	352	341	1637	527	86	53	86	50	78	-0.063	16.55	1.16
55															6.5	-0.2	468	247	339	313	353	344	1626	527	86	53	86	50	77	-0.063	16.71	0.86
56															6.3	-0.2	477	250	343	313	354	347	1613	530	86	53	86	50	77	-0.064	16.83	0.92
57															6.2	-0.2	487	253	349	313	356	352	1605	528	86	53	86	50	78	-0.063	16.67	1.11
58															6.0	-0.2	489	255	354	313	357	354	1617	526	86	53	86	50	78	-0.063	16.58	1.02
59															5.9	-0.1	492	257	357	312	358	355	1616	521	86	53	86	50	78	-0.062	16.63	0.79
60															5.7	-0.2	495	260	361	312	359	357	1646	523	86	53	86	50	78	-0.063	16.51	0.55
61															5.6	-0.1	494	262	364	312	361	359	1654	524	86	53	86	51	79	-0.062	16.52	0.5
62															5.4	-0.2	495	264	368	312	362	360	1663	526	86	53	86	51	78	-0.063	16.7	0.81
63															5.2	-0.2	495	266	371	313	364	362	1654	528	86	53	86	51	78	-0.063	16.81	0.92
64															5.0	-0.2	495	268	373	313	366	363	1648	528	86	53	86	51	78	-0.062	16.83	0.92
65															4.8	-0.2	498	271	376	313	367	365	1647	527	86	53	86	51	79	-0.063	16.81	0.89
66															4.7	-0.2	499	273	379	313	369	367	1642	526	85	53	87	51	79	-0.062	16.77	0.8
67															4.5	-0.2	502	275	382	313	370	368	1644	525	85	53	87	51	79	-0.063	16.77	0.84
68															4.4	-0.1	505	278	384	314	372	371	1654	525	85	53	87	51	79	-0.062	16.81	0.72
69															4.2	-0.2	509	280	389	314	373	373	1660	529	85	53	88	51	78	-0.063	16.86	0.72
70															4.1	-0.2	511	283	392	314	373	375	1645	526	85	53	88	51	79	-0.062	16.94	0.86
71															3.9	-0.2	511	285	394	315	374	376	1652	522	85	53	88	51	79	-0.062	16.96	0.75

Wood Heater Test Data

Run: 1

Manufacturer: Hearth & Home
Model: Dauntless NC
Tracking No.: 2389
Project No.: 061WS104E
Test Date: 04-Oct-19
Beginning Clock Time:

Total Sampling Time: 101 min
Recording Interval: 1 min
Background Sample Volume: cubic feet

Meter Box Y Factor: 0.992 (1) 0.989 (2) (Amb)

Barometric Pressure: Begin 29.52 Middle End 29.6 Average 29.56

OMNI Equipment Numbers:

PM Control Modules: 371, 372
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.284 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: #DIV/0! ft/sec.
Initial Tunnel Flow: #DIV/0! scfm
Average Tunnel Flow: #DIV/0! scfm
Post-Test Leak Check (1): cfm @ in. Hg
Post-Test Leak Check (2): cfm @ in. Hg
Average Test Piece Fuel Moisture: 20.90 Dry Basis %

Technician Signature:

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP										"H2O
Temp:										°F

V_{stav} ft/sec V_{scent} ft/sec F_p

	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst Exit	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
72															3.7	-0.2	512	287	397	315	376	377	1662	522	85	53	88	51	79	-0.062	16.8	0.46
73															3.6	-0.2	513	290	399	316	378	379	1667	521	85	53	88	51	79	-0.062	16.78	0.43
74															3.5	-0.1	515	292	401	315	378	380	1662	517	85	53	88	51	79	-0.061	16.83	0.42
75															3.3	-0.2	515	294	403	315	378	381	1669	516	85	53	88	51	79	-0.061	16.76	0.37
76															3.1	-0.2	516	296	405	316	379	382	1675	514	85	53	88	51	79	-0.061	16.65	0.32
77															3.0	-0.1	517	299	407	315	379	383	1674	514	84	53	88	51	79	-0.061	16.59	0.27
78															2.9	-0.1	518	301	408	316	380	385	1675	513	84	53	88	51	79	-0.061	16.58	0.27
79															2.8	-0.2	519	303	411	315	382	386	1678	514	84	53	88	51	79	-0.061	16.55	0.23
80															2.6	-0.2	521	305	412	315	382	387	1663	517	84	53	88	51	79	-0.062	16.55	0.25
81															2.4	-0.1	524	308	414	316	384	389	1657	519	84	53	88	51	80	-0.061	16.55	0.27
82															2.3	-0.2	526	310	416	316	382	390	1643	517	84	53	88	51	79	-0.061	16.61	0.35
83															2.2	-0.1	528	312	418	316	384	392	1621	512	84	53	88	51	80	-0.061	16.43	0.23
84															2.0	-0.2	529	315	420	315	384	393	1618	509	84	53	88	51	79	-0.060	16.05	0.13
85															1.8	-0.2	537	317	422	314	384	395	1604	519	84	53	88	51	79	-0.062	15.75	0.09
86															1.7	-0.2	554	320	426	314	385	400	1559	517	84	53	88	51	79	-0.061	15.69	0.17
87															1.5	-0.2	564	323	429	314	386	403	1541	510	84	53	88	51	80	-0.061	16.02	0.34
88															1.5	-0.1	570	328	432	312	384	405	1520	502	84	53	88	51	80	-0.059	15.66	0.2
89															1.3	-0.2	573	331	434	309	384	406	1506	498	83	53	87	51	81	-0.059	15.31	0.08
90															1.2	-0.1	574	335	435	307	382	407	1503	492	83	53	87	51	80	-0.058	14.96	0.03
91															1.1	-0.1	573	338	437	305	382	407	1492	489	83	53	87	51	81	-0.058	14.64	0.02
92															0.9	-0.2	571	340	437	302	381	406	1476	487	83	53	87	51	80	-0.058	14.28	0.01
93															0.9	-0.1	570	343	439	299	380	406	1456	484	83	53	87	51	81	-0.057	13.94	0.01
94															0.7	-0.1	570	345	440	296	380	406	1437	482	83	53	87	51	80	-0.057	13.56	0.01
95															0.7	0.0	569	346	441	293	380	406	1417	479	83	53	87	51	81	-0.057	13.3	0.01
96															0.5	-0.2	570	348	443	290	380	406	1417	477	83	53	87	51	81	-0.057	13.08	0.02
97															0.4	-0.1	571	349	444	288	379	406	1402	475	83	53	87	51	81	-0.056	13.01	0.03
98															0.3	-0.1	571	351	446	286	379	407	1386	472	83	53	87	51	81	-0.056	12.92	0.05
99															0.2	-0.1	571	352	447	285	379	407	1363	470	83	53	86	51	81	-0.056	12.7	0.06
100															0.2	0.0	571	352	448	282	378	406	1354	465	83	53	86	51	81	-0.056	12.44	0.08
101															0.0	-0.1	571	353	449	279	378	406	1362	463	83	53	86	51	81	-0.055	12.21	0.09
Avg/Tot	0.000	0.000	0.00	#DIV/0!	#DIV/0!	#DIV/0!		#DIV/0!	#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!								145.8				52	87	50	78	-0.061		

Wood Heater Test Results

Manufacturer: Hearth & Home
Model: Dauntless NC
Project No.: 061WS104E
Tracking No.: 2389
Run: 1
Test Date: 10/04/19

Burn Rate	**3.68 kg/hr dry**
Total Time of Test	101 minutes

	AMBIENT	SAMPLE TRAIN 1	SAMPLE TRAIN 2	FIRST HOUR FILTER (TRAIN 1)
	#DIV/0!			

FINAL AVERAGE RESULTS

QUALITY CHECKS

Ambient Temp (55-90°F)	OK

Technician Signature: _____

Wood Heater Efficiency Results - CSA B415.1

Manufacturer: Hearth & Home
Model: Dauntless NC
Date: 10/04/19
Run: 1
Control #: 061WS104E
Test Duration: 101
Output Category: IV

Technician Signature: 

Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
Overall Efficiency	73.1%	78.3%
Combustion Efficiency	93.8%	93.8%
Heat Transfer Efficiency	78%	83.5%

Output Rate (kJ/h)	52,105	49,428	**(Btu/h)**
Burn Rate (kg/h)	3.79	8.35	**(lb/h)**
Input (kJ/h)	71,252	67,590	**(Btu/h)**

Test Load Weight (dry kg)	6.38	14.06	**dry lb**
MC wet (%)	17.28701406		
MC dry (%)	20.90		
Particulate (g)	#DIV/0!		
CO (g)	523		
Test Duration (h)	1.68		

Emissions	Particulate	CO
g/MJ Output	#DIV/0!	5.96
g/kg Dry Fuel	#DIV/0!	81.90
g/h	#DIV/0!	310.42
lb/MM Btu Output	#DIV/0!	13.85

Air/Fuel Ratio (A/F)	6.66

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

Adjunct to ASTM E XXXX Wood Heater Cordwood Test Method - May 10, 2017 Version
Cordwood Fuel Load Calculators - 10 lb/ft^3 Nominal Load Density
Core 45-65% of Total Load Weight, Remainder 35-55% of Total Load Weight
Values to be input manually

For All Usable Firebox Volumes - High Fire Test Only

Nominal Required Load Density (wet basis)	10	lb/ft^3				
Usable Firebox Volume	1.82	ft^3				
Total Nom. Load Wt. Target	18.20	lb				
Total Load Wt. Allowable Range	17.30	to	19.10	lb		
Core Target Wt. Allowable Range	8.20	to	11.80	lb		
Remainder Load Wt. Allowable Range	6.40	to	10.00	lb		
						Mid-Point
Core Load Pc. Wt. Allowable Range	2.70	to	4.60	lb		3.65
Remainder Load Pc. Wt. Allowable Range	1.80	to	10.00	lb		5.90
	Pc. #					
Core Load Piece Wt. Actual	1	4.00	lb	In Range		
	2	4.28	lb	In Range		
	3	3.22	lb	In Range		
Core Load Total. Wt. Actual		11.50	lb	In Range		
	Pc. #					
Remainder Load Piece Wt.	1	2.18	lb	In Range		
(1 to 3 Pcs.)	2	5.19	lb	In Range		
	3		lb	NA		
Remainder Load Tot. Wt. Act		7.37	lb	In Range		
Total Load Wt. Actual		18.87	lb	In Range		
Core % of Total Wt.		61%		In Range		45-65%
Remainder % of Total Wt.		39%		In Range		35-55%
Actual Load % of Nominal Target		104%		In Range		95-105%
Actual Fuel Load Density		10.4	lb/ft^3			
Kindling and Start-up Fuel						
Maximim Kindling Wt. (20% of Tot. Load Wt.)		3.77	lb			
Actual Kindling Wt.		3.71	lb	In Range		19.7%
Maximum Start-up Fuel Wt. (30% of Tot. Load Wt.)		5.66	lb			
Actual Start-up Fuel Wt.		5.61	lb	In Range		29.7%
Allowable Residual Start-up Fuel Wt. Range	1.9	to	3.8	lb		Mid-Point
Actual Residual Start-up Fuel Wt.		2.7	lb	In Range		2.8
Total Wt. All Fuel Added (wet basis)		28.19	lb			
High Fire Test Run End Point Range	Low		High			Mid-Point
Based on Fuel Load Wt. (w/tares)	1.7	to	2.1	lb		1.9
Actual Fuel Load Ending Wt.		1.9	lb	In Range		

Fuel Piece Moisture Reading (%-dry basis)

1	2	3	Ave.		Pc. Wt. Dry Basis		
18.2	18.6	19.2	18.7	In Range	3.37 lb	1.53	kg
23.4	26.5	20	23.3	In Range	3.47 lb	1.57	kg
18.2	19.6	19.8	19.2	In Range	2.70 lb	1.23	kg
20	19.4	19.6	19.7	In Range	1.82 lb	0.83	kg
21	25.2	24.8	23.7	In Range	4.20 lb	1.90	kg
			NA	NA	NA lb	NA	kg

Total Load Ave. MC (%-dry basis)	21.3	In Range	
Total Load Ave. MC % (wet basis)	17.5		
Total Test Load Weight (dry basis) →			15.56 lb 7.06 kg

Kindling Moisture (%-dry basis)

10	10	10	10.0	In Range	3.37 lb	1.53 kg

Start-up Fuel Moisture Readings (%-dry basis)

24.6	18.2	20.2	21.0	In Range	4.64 lb	2.10 kg

Total Wt. All Fuel Added (dry basis) →	23.57 lb	10.69 kg
Total Wt. All Fuel Burned (dry basis) →	19.0 lb	8.6 kg

OMNI-Test Laboratories, Inc.

Wood Heater Run Sheets

Client: Hearth & Home Project Number: 0061WS104E Run Number: i
Model: Dauntless-Flexburn N/C Tracking Number: 2389 Date: 10/4/19
Test Crew:
OMNI Equipment ID numbers:

Wood Heater Run Notes

Air Control Settings

Primary: fully ope

Secondary: fixed

Tertiary/Pilot: N/A

Fan: on High

Preburn Notes

Time	Notes
Ø	Torch used for 40 seconds, top down burn, door closed @ 2.0 min. Comb Air fully open FAN on High. At 15.5 min loaded Start-up fuel. Loaded fuel, closed bypass by 16 min. At 16:45 re-positioned fuel.
51	2.6 lbs loaded fuel load.

Test Notes

Sketch test fuel configuration:

See photo

Start up procedures & Timeline:

Bypass: open until 55 seconds then closed
Fuel loaded by: 45 seconds
Door closed at: 55 seconds
Primary air: fully open entire test

Notes: FAN on High entire test

Time	Notes
60	changed front filter in train A changed front filter in train B

Technician Signature: BC

Date: 11/11/19

OMNI-Test Laboratories, Inc.

Wood Heater Run Sheets

Client: Hearth & Home Project Number: 0061WS104E Run Number: 1
Model: Dauntless-Flexburn NC Tracking Number: 2389 Date: 10/4/19
Test Crew: D Davis
OMNI Equipment ID numbers:

Wood Heater Supplemental Data

Start Time: 10:52 Booth #: N/A
Stop Time:

Stack Gas Leak Check:
Initial: good Final: good

Sample Train Leak Check:
A: 0.0 @ 12 "Hg
B: 0.0 @ 11 "Hg

Calibrations: Span Gas CO_2: 15.0 CO: 2.0

	Pre Test		Post Test	
	Zero	Span	Zero	Span
Time	1047	1047		
CO_2	-0.00	15.00		
CO	-0.00	2.00		

Air Velocity (ft/min): Initial: <50 Final: <50
Scale Audit (lbs): Initial: 10.0 Final: 10.0
Pitot Tube Leak Test: Initial: good Final: good
Stack Diameter (in): 6"
Induced Draft: 0.0
% Smoke Capture: 100%
Flue Pipe Cleaned Prior to First Test in Series:
Date: 9/30/19 Initials: BR

	Initial	Middle	Ending
P_b (in/Hg)	29.52		29.60
RH (%)	41		44
Ambient (°F)	72		81

Tunnel Traverse

Microtector Reading	dP (in H_2O)	T(°F)
	.076	77
	.084	77
	.084	77
	.074	77
	.074	77
	.084	77
	.086	77
	.076	77
Center:		
	.086	77

Tunnel Static Pressure (in H_2O):	
Beginning of Test	End of Test
-.284	-.284

Background Filter Volume: N/A

Technician Signature: [signature] Date: 11/1/19

Run 1

High Burn

Proportional Rate Verification
10-minute data

OMNI-Test Laboratories, Inc.

Wood Heater Test Data

Run: 1

Manufacturer: Hearth & Home
Model: Dauntless NC
Tracking No.: 2389
Project No.: 061WS104E
Test Date: 04-Oct-19
Beginning Clock Time: 10:52

Total Sampling Time: 156 min
Recording Interval: 10 min
Background Sample Volume: ____ cubic feet

Meter Box Y Factor: 0.992 (1) 0.989 (2) ____ (Amb)

Barometric Pressure:

Begin	Middle	End	Average
29.52		29.6	29.56

OMNI Equipment Numbers: 0

PM Control Modules: 371, 372
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.284 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 19.50 ft/sec.
Initial Tunnel Flow: 212.8 acfm
Average Tunnel Flow: 205.7 scfm
Post-Test Leak Check (1): 0.000 cfm @ 12 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ 11 in. Hg
Average Test Piece Fuel Moisture: 19.36 Dry Basis %

Technician Signature:

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.076	0.084	0.084	0.074	0.074	0.084	0.086	0.076	0.086	"H2O
Temp:	77	77	77	77	77	77	77	77	77	°F

V_{straw} 19.08 ft/sec V_{scent} 19.74 ft/sec F_p 0.967

	Particulate Sampling Data													Fuel Weight (lb)		Temperature Data (°F)													Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst Exit	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
0	0.000	0.000			1.87	77	0.19	2.32	77	-2.2	77	0.090																	72			
10	1.597	1.716	0.16	0.17	2.28	78	0.29	1.78	77	-3.6	115	0.080	98	100		0.0													73			
20	3.234	3.442	0.16	0.17	2.32	78	-0.6	1.75	78	-3.9	101	0.080	100	99		0.0													74			
30	4.875	5.171	0.16	0.17	2.25	78	-0.8	1.75	78	-4.5	102	0.080	100	100		0.0													74			
40	6.501	6.881	0.16	0.17	2.28	79	-7.54	1.75	78	-10.9	103	0.090	93	93		0.0													74			
50	8.153	8.599	0.17	0.17	2.31	79	-8.41	1.79	78	-3.2	102	0.080	101	99		0.0													76			
60	9.809	10.331	0.17	0.17	2.19	80	-11.52	1.77	79	-3.3	105	0.080	101	100		0.0													75			
70	11.437	12.066	0.16	0.17	2.22	80	0.07	1.78	79	-3.3	112	0.090	94	95		0.0													76			
80	13.073	13.795	0.16	0.17	2.24	80	0.15	1.76	79	-3.5	115	0.090	95	95		0.0													76			
90	14.712	15.535	0.16	0.17	2.23	81	0.38	1.79	79	-3.7	117	0.080	101	101		0.0													76			
100	16.353	17.274	0.16	0.17	2.28	81	0.03	1.79	80	-3.7	118	0.090	95	95		0.0													77			
110	17.996	19.013	0.16	0.17	2.28	82	0.32	1.79	80	-3.4	120	0.090	95	96		0.0													77			
120	19.647	20.752	0.17	0.17	2.24	82	-0.2	1.77	80	-3.7	120	0.090	96	96		0.0													79			
130	21.293	22.491	0.16	0.17	2.25	82	0.19	1.79	80	-3.7	120	0.080	101	101		0.0													79			
140	22.934	24.230	0.16	0.17	2.23	83	-0.15	1.78	80	-3.4	120	0.080	101	101		0.0													79			
150	24.582	25.971	0.16	0.17	2.27	83	0.26	1.80	80	-3.7	117	0.080	101	101		0.0													81			
156	26.236	27.714	0.17	0.17	2.25	83	-0.13	1.79	81	-3.7	116	0.090	95	95		0.0													82			
Avg/Tot	26.236	27.714	0.16	0.17	2.23	80		1.81	79		111	0.085	98	98								0.0				#DIV/0!	#DIV/0!	#DIV/0!	76	#DIV/0!		

Wood Heater Test Results

Manufacturer: Hearth & Home
Model: Dauntless NC
Project No.: 061WS104E
Tracking No.: 2389
Run: 1
Test Date: 10/04/19

Burn Rate	**3.31 kg/hr dry**
Average Tunnel Temperature	111 degrees Fahrenheit
Average Gas Velocity in Dilution Tunnel - vs	19.50 feet/second
Average Gas Flow Rate in Dilution Tunnel - Qsd	12340.5 dscf/hour
Average Delta p	0.085 inches H20
Total Time of Test	156 minutes

	AMBIENT	SAMPLE TRAIN 1	SAMPLE TRAIN 2	FIRST HOUR FILTER (TRAIN 1)
Total Sample Volume - Vm	0.000 cubic feet	26.236 cubic feet	27.714 cubic feet	9.809 cubic feet
Average Gas Meter Temperature	76 degrees Fahrenheit	80 degrees Fahrenheit	79 degrees Fahrenheit	80 degrees Fahrenheit
Total Sample Volume (Standard Conditions) - Vmstd	0.000 dscf	25.255 dscf	26.635 dscf	9.442 dscf
Total Particulates - m_n	0 mg	6.7 mg	7.7 mg	5.1 mg
Particulate Concentration (dry-standard) - C_f/C_s	0.000000 grams/dscf	0.00027 grams/dscf	0.00029 grams/dscf	0.00054 grams/dscf
Total Particulate Emissions - E_T	0.00 grams	8.51 grams	9.28 grams	6.67 grams
Particulate Emission Rate	0.00 grams/hour	3.27 grams/hour	3.57 grams/hour	6.67 grams/hour
Emissions Factor		0.99 g/kg	1.08 g/kg	#DIV/0! g/kg
Difference from Average Total Particulate Emissions		0.38 grams	0.38 grams	
		Dual Train Comparison Results Are Acceptable		

FINAL AVERAGE RESULTS

Complete Test Run	
Total Particulate Emissions - E_T	8.89 grams
Particulate Emission Rate	**3.42 grams/hour**
Emissions Factor	1.03 grams/kg
First Hour Emissions	
Total Particulate Emissions - E_T	6.67 grams
Particulate Emission Rate	6.67 grams/hour
Emissions Factor	#DIV/0! grams/kg
7.5% of Average Total Particulate Emissions	0.67 grams

QUALITY CHECKS

Filter Temps < 90 °F	OK
Filter Face Velocity (47 mm)	OK
Dryer Exit Temp < 80F	OK
Leakage Rate	OK
Ambient Temp (55-90°F)	OK
Negative Probe Weight Eval.	OK
Pro-Rate Variation	OK

Technician Signature: _____

Run 2

Medium Burn

OMNI-Test Laboratories, Inc.

Wood Heater Test Data

7

Run: 2

Manufacturer: Hearth & Home
Model: Dauntless NC
Tracking No.: 2389
Project No.: 061WS104E
Test Date: 04-Oct-19
Beginning Clock Time: 13:58

Total Sampling Time: 480 min
Recording Interval: 1 min
Background Sample Volume: _____ cubic feet

Meter Box Y Factor: 0.992 (1) 0.989 (2) _____ (Amb)

Barometric Pressure: Begin 29.63 Middle _____ End 29.76 Average 29.70 0

OMNI Equipment Numbers: _____

PM Control Modules: 371, 372
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.284 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 19.19 ft/sec.
Initial Tunnel Flow: 209.9 acfm
Average Tunnel Flow: 211.0 acfm
Post-Test Leak Check (1): 0.000 cfm @ 8 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ 6 in. Hg
Average Test Piece Fuel Moisture: 22.67 Dry Basis %

Technician Signature: _____

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.074	0.084	0.080	0.072	0.072	0.080	0.082	0.076	0.086	"H2O
Temp:	79	79	79	79	79	79	79	79	79	°F

V_{straw} 18.84 ft/sec V_{scent} 19.74 ft/sec F_p 0.955

	Particulate Sampling Data													Fuel Weight (lb)		Temperature Data (°F)											Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst Exit	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
0	0.000	0.000			-0.01	83	1.62	0.01	81	1.6	100	0.090			20.5		482	379	393	225	370	370	924	280	83	66	83	58	81	-0.031	7.03	0.46
1	0.140	0.154	0.14	0.15	2.19	83	0.25	1.76	81	-3.3	133	0.090	86	90	20.4	-0.2	475	377	391	223	370	367	957	272	84	53	84	52	80	-0.032	6.96	0.46
2	0.306	0.327	0.17	0.17	2.39	83	-0.08	1.77	81	-3.1	104	0.090	100	99	20.2	-0.1	453	374	387	222	370	361	1206	277	84	51	85	50	81	-0.038	5.8	0.41
3	0.475	0.500	0.17	0.17	2.37	84	0.04	1.76	81	-3.1	102	0.090	101	99	20.2	0.0	435	370	382	220	370	355	1269	286	84	51	85	50	80	-0.039	5.17	0.19
4	0.644	0.673	0.17	0.17	2.37	83	0.44	1.76	81	-3.3	102	0.090	101	99	20.1	-0.1	419	366	377	220	369	350	1272	294	84	51	86	50	80	-0.039	8.98	0.1
5	0.812	0.846	0.17	0.17	2.25	84	0.46	1.78	81	-3.4	101	0.080	107	105	20.0	0.0	405	362	373	219	368	345	1286	298	84	51	86	50	80	-0.040	10.08	0.06
6	0.977	1.020	0.17	0.17	2.26	84	0.21	1.78	81	-3.4	101	0.090	99	99	19.9	-0.1	393	358	367	220	367	341	1300	302	84	51	86	51	80	-0.040	10.48	0.05
7	1.143	1.194	0.17	0.17	2.27	83	0.07	1.79	81	-3.2	101	0.080	105	105	19.9	0.0	381	354	363	221	365	337	1312	305	83	51	86	51	80	-0.040	10.67	0.03
8	1.308	1.367	0.17	0.17	2.25	84	0.44	1.78	81	-3.3	100	0.090	99	99	19.8	-0.1	371	349	359	222	363	333	1316	307	83	51	86	51	79	-0.041	10.68	0.03
9	1.474	1.541	0.17	0.17	2.25	84	0.14	1.78	81	-3.3	100	0.080	105	105	19.7	-0.1	362	345	354	221	361	329	1332	309	83	51	86	51	79	-0.041	10.64	0.03
10	1.638	1.715	0.16	0.17	2.25	83	0	1.78	81	-3.1	100	0.090	98	99	19.6	-0.1	353	341	349	222	359	326	1321	311	83	51	86	51	79	-0.041	10.59	0.02
11	1.803	1.889	0.17	0.17	2.26	83	-0.06	1.78	81	-3.3	100	0.090	99	99	19.5	-0.1	346	336	345	223	357	321	1336	313	83	51	86	51	78	-0.041	10.71	0.02
12	1.969	2.062	0.17	0.17	2.24	83	0.15	1.77	81	-3.4	100	0.080	105	105	19.5	0.0	337	332	340	224	355	318	1341	316	83	51	86	51	79	-0.042	10.74	0.02
13	2.133	2.236	0.16	0.17	2.23	83	0.38	1.77	81	-3.4	100	0.090	98	99	19.4	-0.1	331	328	336	225	353	315	1349	318	84	51	86	51	79	-0.042	10.86	0.02
14	2.297	2.409	0.16	0.17	2.24	83	0.46	1.78	81	-3.4	100	0.090	98	99	19.3	-0.1	325	324	332	227	351	312	1364	321	84	51	86	51	80	-0.042	10.91	0.03
15	2.462	2.583	0.17	0.17	2.25	83	0.2	1.77	81	-3.4	100	0.090	99	99	19.2	-0.1	320	319	328	228	349	309	1390	322	84	51	86	51	80	-0.042	11.13	0.02
16	2.627	2.756	0.17	0.17	2.24	83	0.31	1.77	81	-3.3	100	0.090	99	99	19.1	-0.1	315	315	324	230	347	306	1386	323	84	51	85	51	79	-0.042	11.41	0.02
17	2.790	2.929	0.16	0.17	2.22	83	0.41	1.77	81	-3.1	100	0.080	103	105	19.1	0.0	310	312	321	231	345	304	1378	326	84	51	85	51	79	-0.043	11.64	0.01
18	2.954	3.102	0.16	0.17	2.24	83	0.27	1.78	81	-3.3	100	0.080	104	105	18.9	-0.1	306	308	317	233	342	301	1391	328	85	51	85	51	79	-0.043	11.67	0.01
19	3.119	3.276	0.17	0.17	2.21	83	0.15	1.77	81	-3.2	100	0.080	105	105	18.9	-0.1	302	304	313	234	340	299	1405	330	85	51	85	51	79	-0.043	11.84	0.01
20	3.283	3.448	0.16	0.17	2.21	83	0.21	1.76	81	-3.1	100	0.080	104	104	18.7	-0.1	299	301	310	235	338	297	1427	332	85	51	85	51	79	-0.044	11.98	0.01
21	3.446	3.622	0.16	0.17	2.22	83	0.48	1.76	81	-3.4	100	0.080	103	105	18.6	-0.1	295	297	307	237	336	294	1439	334	85	51	84	51	79	-0.044	12.21	0
22	3.610	3.794	0.16	0.17	2.23	83	0.01	1.77	81	-3.3	100	0.090	98	98	18.5	-0.1	292	294	303	238	334	292	1451	337	85	51	84	51	78	-0.044	12.44	0
23	3.774	3.968	0.16	0.17	2.22	83	0.48	1.76	81	-3.1	100	0.090	98	99	18.4	-0.1	289	291	301	240	332	291	1463	339	85	51	85	51	79	-0.044	12.62	0
24	3.937	4.140	0.16	0.17	2.22	83	0.04	1.76	81	-3.4	101	0.090	98	98	18.3	-0.1	287	288	298	241	330	289	1465	341	85	52	85	51	79	-0.045	12.78	0
25	4.101	4.314	0.16	0.17	2.21	83	0.49	1.76	81	-3.1	101	0.080	104	105	18.2	-0.1	285	285	295	243	328	287	1472	342	85	52	85	51	79	-0.045	13.08	0.01
26	4.265	4.486	0.16	0.17	2.22	83	-0.03	1.76	81	-3.2	100	0.090	98	98	18.2	-0.1	283	282	293	244	326	286	1495	346	85	52	85	51	78	-0.045	13.18	0.01
27	4.428	4.659	0.16	0.17	2.22	83	-0.03	1.76	81	-3.2	101	0.080	104	105	18.0	-0.1	282	279	290	246	323	284	1510	348	85	52	86	51	79	-0.045	13.38	0.02
28	4.592	4.832	0.16	0.17	2.22	83	0.5	1.76	81	-3.2	101	0.080	104	105	18.0	-0.1	281	277	288	247	322	283	1514	351	85	52	86	51	78	-0.046	13.57	0.02
29	4.756	5.004	0.16	0.17	2.22	83	-0.05	1.76	81	-3.3	101	0.090	98	98	17.8	-0.2	280	274	286	248	320	282	1519	353	84	52	86	51	78	-0.046	13.81	0.03
30	4.921	5.179	0.17	0.18	2.24	83	-0.07	1.79	81	-3.4	101	0.080	105	106	17.7	-0.1	279	272	284	251	318	281	1506	354	84	52	86	51	78	-0.047	13.89	0.04
31	5.086	5.353	0.17	0.17	2.26	83	0.43	1.79	81	-3.3	101	0.090	99	99	17.6	-0.1	281	270	282	252	316	280	1440	350	84	52	86	51	78	-0.046	13.86	0.05
32	5.250	5.527	0.16	0.17	2.26	83	0.35	1.79	81	-3.3	101	0.090	98	99	17.5	-0.1	282	268	280	253	314	279	1399	347	84	52	86	51	78	-0.045	13.17	0.03
33	5.416	5.702	0.17	0.18	2.26	83	0.25	1.79	82	-3.1	101	0.090	99	100	17.4	-0.1	283	266	278	254	313	279	1385	344	84	52	86	51	78	-0.045	12.16	0.01
34	5.580	5.876	0.16	0.17	2.24	83	0.48	1.80	81	-3.4	100	0.090	98	99	17.3	-0.1	282	264	277	254	311	278	1404	346	84	52	86	51	78	-0.046	11.62	0.01
35	5.745	6.051	0.17	0.18	2.26	83	0.42	1.80	81	-3.2	101	0.080	105	106	17.2	-0.1	281	262	275	254	309	276	1408	347	83	52	86	51	78	-0.046	11.86	0.01
36	5.910	6.225	0.17	0.17	2.26	83	-0.07	1.78	82	-3.4	101	0.080	105	105	17.1	-0.1	281	260	274	255	308	276	1418	347	83	53	85	52	78	-0.046	12.09	0

Wood Heater Test Data

7

Run: 2

Manufacturer: Hearth & Home
Model: Dauntless NC
Tracking No.: 2389
Project No.: 061WS104E
Test Date: 04-Oct-19
Beginning Clock Time: 13:58

Total Sampling Time: 480 min
Recording Interval: 1 min
Background Sample Volume: _____ cubic feet

Meter Box Y Factor: 0.992 (1) 0.989 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	29.63		29.76	29.70 0

OMNI Equipment Numbers: _____

PM Control Modules: 371, 372
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.284 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 19.19 ft/sec.
Initial Tunnel Flow: 209.9 acfm
Average Tunnel Flow: 211.0 acfm
Post-Test Leak Check (1): 0.000 cfm @ 8 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ 6 in. Hg
Average Test Piece Fuel Moisture: 22.67 Dry Basis %

Technician Signature: _____

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.074	0.084	0.080	0.072	0.072	0.080	0.082	0.076	0.086	"H2O
Temp:	79	79	79	79	79	79	79	79	79	°F

V_{straw} 18.84 ft/sec V_{scent} 19.74 ft/sec F_p 0.955

	Particulate Sampling Data													Fuel Weight (lb)		Temperature Data (°F)											Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst Exit	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
37	6.075	6.400	0.17	0.18	2.25	83	-0.05	1.79	82	-3.3	101	0.080	105	106	17.0	-0.1	282	259	273	254	306	275	1437	349	83	53	85	52	78	-0.046	12.23	0.01
38	6.240	6.574	0.17	0.17	2.25	83	0.16	1.79	82	-3.4	101	0.080	105	105	16.9	-0.1	282	257	272	255	305	274	1456	351	83	53	85	52	78	-0.046	12.51	0.01
39	6.404	6.748	0.16	0.17	2.26	83	0.48	1.78	82	-3.2	101	0.090	98	99	16.7	-0.2	282	255	270	255	303	273	1465	353	83	53	85	52	79	-0.046	12.77	0.01
40	6.569	6.923	0.17	0.18	2.24	83	0.05	1.77	82	-3.4	101	0.080	105	106	16.7	0.0	283	254	269	256	302	273	1482	356	83	53	85	52	78	-0.047	13.06	0.01
41	6.734	7.097	0.17	0.17	2.24	83	0.46	1.79	82	-3.3	101	0.080	105	105	16.5	-0.2	284	253	268	257	301	273	1501	359	84	53	85	52	78	-0.047	13.36	0.02
42	6.899	7.271	0.17	0.17	2.24	83	0.41	1.78	82	-3.4	101	0.090	99	99	16.4	-0.2	284	251	267	258	299	272	1518	363	84	53	85	52	78	-0.048	13.74	0.05
43	7.064	7.445	0.17	0.17	2.25	83	0.01	1.78	82	-3.3	101	0.080	105	105	16.3	-0.1	285	250	266	260	298	272	1532	367	84	53	85	52	78	-0.048	14.08	0.11
44	7.229	7.619	0.17	0.17	2.24	83	-0.02	1.80	82	-3.4	101	0.080	105	105	16.1	-0.2	286	249	265	261	297	272	1541	371	85	53	85	52	78	-0.049	14.42	0.15
45	7.393	7.794	0.16	0.18	2.23	83	0.42	1.79	82	-3.2	102	0.080	104	106	16.1	-0.1	287	248	264	263	296	272	1541	372	85	53	85	52	78	-0.049	14.61	0.18
46	7.557	7.968	0.16	0.17	2.24	83	0.43	1.78	82	-3.2	102	0.090	98	99	15.9	-0.2	288	247	263	265	295	272	1545	375	85	53	85	52	78	-0.049	14.67	0.18
47	7.721	8.143	0.16	0.18	2.25	83	0.07	1.78	82	-3.4	102	0.090	98	100	15.7	-0.2	290	245	263	267	294	272	1556	378	85	54	86	52	78	-0.050	14.84	0.2
48	7.886	8.317	0.17	0.17	2.24	83	0.47	1.79	82	-3.4	102	0.080	105	105	15.6	-0.1	294	245	263	268	292	272	1554	378	85	54	86	52	78	-0.050	14.94	0.34
49	8.050	8.490	0.16	0.17	2.23	83	-0.07	1.78	82	-3.2	103	0.090	98	99	15.5	-0.1	295	244	263	269	291	272	1584	383	85	54	86	52	77	-0.051	14.96	0.64
50	8.214	8.665	0.16	0.17	2.24	83	0.03	1.78	82	-3.1	103	0.080	104	106	15.4	-0.2	295	243	263	271	290	272	1582	387	85	54	86	52	77	-0.051	15.14	0.92
51	8.379	8.839	0.16	0.17	2.23	83	0.41	1.79	82	-3.4	103	0.090	99	99	15.2	-0.2	296	243	263	273	290	273	1583	390	85	54	86	52	78	-0.052	15.29	1.26
52	8.542	9.013	0.16	0.17	2.21	83	0.12	1.79	82	-3.4	103	0.090	98	99	15.0	-0.2	298	242	263	276	289	274	1586	390	85	54	86	52	78	-0.052	15.26	1.54
53	8.706	9.187	0.16	0.17	2.23	83	0.45	1.77	82	-3.4	103	0.090	98	99	15.0	-0.1	299	241	263	278	288	274	1584	390	85	54	86	53	78	-0.052	15.26	1.71
54	8.870	9.361	0.16	0.17	2.22	83	0.28	1.78	82	-3.2	103	0.090	98	99	14.8	-0.2	301	240	264	278	287	274	1582	392	85	54	86	53	78	-0.052	15.21	1.82
55	9.034	9.534	0.16	0.17	2.20	83	0.05	1.79	82	-3.2	104	0.080	104	105	14.6	-0.2	302	240	264	280	287	275	1572	393	85	54	86	53	78	-0.052	15.19	1.88
56	9.197	9.709	0.16	0.17	2.22	83	0.14	1.78	82	-3.3	103	0.090	98	100	14.5	-0.2	304	239	265	280	286	275	1568	393	85	54	86	53	78	-0.052	15.18	2.02
57	9.360	9.882	0.16	0.17	2.22	83	-0.04	1.77	82	-3.2	104	0.080	104	105	14.3	-0.2	305	239	266	282	285	275	1562	395	85	54	86	53	78	-0.052	15.11	2.21
58	9.524	10.056	0.16	0.17	2.20	83	-0.08	1.77	82	-3.2	104	0.090	98	99	14.2	-0.1	306	238	267	283	285	276	1567	395	85	54	85	53	77	-0.052	15.06	2.34
59	9.687	10.229	0.16	0.17	2.20	83	0.05	1.78	82	-3.4	104	0.090	98	99	14.1	-0.2	307	238	267	284	284	276	1553	397	84	54	85	53	78	-0.053	15.04	2.53
60	9.850	10.403	0.16	0.17	2.22	83	0.03	1.78	82	-3.5	104	0.080	104	105	13.9	-0.2	309	238	268	285	284	277	1546	398	84	54	85	53	78	-0.053	15.05	2.76
61	10.014	10.576	0.16	0.17	2.21	83	0.11	1.76	82	-3.4	104	0.090	98	99	13.7	-0.2	311	238	269	286	283	277	1540	398	84	54	85	53	78	-0.053	14.92	3.33
62	10.176	10.750	0.16	0.17	2.12	83	0.54	1.77	82	-3.4	104	0.090	97	99	13.6	-0.2	313	237	270	287	283	278	1539	398	84	54	85	53	77	-0.053	14.73	3.96
63	10.338	10.923	0.16	0.17	2.26	83	0.27	1.78	82	-3.3	104	0.080	103	105	13.5	-0.1	314	237	271	288	282	278	1537	397	84	54	85	53	78	-0.052	14.76	3.66
64	10.502	11.097	0.16	0.17	2.25	83	0.29	1.77	82	-3.3	104	0.090	98	99	13.3	-0.2	316	237	273	288	281	279	1541	395	84	54	85	53	77	-0.052	14.8	3.35
65	10.667	11.270	0.16	0.17	2.24	83	-0.02	1.77	82	-3.5	104	0.090	99	99	13.2	-0.2	318	236	274	289	281	280	1543	394	84	54	85	53	77	-0.052	14.81	3.16
66	10.831	11.444	0.16	0.17	2.25	83	0.49	1.78	82	-3.4	104	0.080	104	105	13.0	-0.2	320	237	275	290	281	281	1546	394	84	54	85	53	78	-0.052	14.83	2.63
67	10.997	11.617	0.17	0.17	2.23	83	-0.06	1.77	82	-3.2	104	0.090	100	99	12.9	-0.1	322	237	277	290	280	281	1549	395	84	54	85	53	78	-0.052	14.88	2.38
68	11.161	11.790	0.16	0.17	2.23	83	0.31	1.77	82	-3.2	104	0.090	98	99	12.8	-0.2	324	237	279	290	280	282	1542	395	84	54	85	53	77	-0.050	14.88	2.38
69	11.325	11.964	0.16	0.17	2.25	83	0.44	1.76	82	-3.4	103	0.090	98	99	12.6	-0.2	328	237	281	291	280	283	1532	393	84	55	86	54	77	-0.052	14.86	2.47
70	11.489	12.137	0.16	0.17	2.25	83	-0.07	1.77	82	-3.2	104	0.080	104	105	12.5	-0.1	331	237	282	291	279	284	1516	395	83	55	86	54	77	-0.052	14.83	2.56
71	11.654	12.310	0.16	0.17	2.25	83	0.48	1.77	82	-3.4	104	0.080	105	105	12.4	-0.2	336	237	285	291	279	286	1519	394	83	55	86	54	77	-0.054	14.82	2.7
72	11.818	12.483	0.16	0.17	2.24	83	-0.06	1.77	82	-3.4	104	0.090	98	99	12.2	-0.1	341	237	287	291	279	287	1519	393	83	55	86	54	77	-0.052	14.71	2.97
73	11.982	12.656	0.16	0.17	2.24	83	0.12	1.76	82	-3.3	104	0.080	104	105	12.1	-0.2	343	238	289	291	279	288	1514	393	83	55	86	54	77	-0.052	14.75	2.82

Wood Heater Test Data

7

Run: 2

Manufacturer: Hearth & Home
Model: Dauntless NC
Tracking No.: 2389
Project No.: 061WS104E
Test Date: 04-Oct-19
Beginning Clock Time: 13:58

Total Sampling Time: 480 min
Recording Interval: 1 min
Background Sample Volume: cubic feet

Meter Box Y Factor: 0.992 (1) 0.989 (2) (Amb)

Barometric Pressure: Begin 29.63 Middle End 29.76 Average 29.70 0

OMNI Equipment Numbers:

PM Control Modules: 371, 372
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.284 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 19.19 ft/sec.
Initial Tunnel Flow: 209.9 acfm
Average Tunnel Flow: 211.0 acfm
Post-Test Leak Check (1): 0.000 cfm @ 8 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ 6 in. Hg
Average Test Piece Fuel Moisture: 22.67 Dry Basis %

Technician Signature:

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.074	0.084	0.080	0.072	0.072	0.080	0.082	0.076	0.086	"H2O
Temp:	79	79	79	79	79	79	79	79	79	°F

V_{straw} 18.84 ft/sec V_{scent} 19.74 ft/sec F_p 0.955

	Particulate Sampling Data													Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst Exit	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
74	12.147	12.829	0.17	0.17	2.22	83	0.48	1.75	82	-3.3	104	0.080	105	105	12.0	-0.1	346	238	292	291	279	289	1520	391	83	55	86	54	77	-0.052	14.79	2.84
75	12.311	13.002	0.16	0.17	2.21	83	0.38	1.76	82	-3.2	104	0.080	104	105	11.8	-0.2	349	239	294	291	278	290	1521	389	84	55	86	54	77	-0.051	14.77	2.68
76	12.474	13.175	0.16	0.17	2.24	83	0.15	1.76	82	-3.3	103	0.080	104	105	11.7	-0.1	353	239	297	291	278	292	1520	388	84	55	86	54	78	-0.054	14.83	2.51
77	12.638	13.348	0.16	0.17	2.24	83	0	1.75	82	-3.3	104	0.090	98	99	11.5	-0.2	356	240	300	290	278	293	1518	387	84	55	86	54	78	-0.051	14.82	2.27
78	12.803	13.521	0.17	0.17	2.22	83	0.27	1.74	82	-3.3	103	0.090	99	99	11.4	-0.1	358	240	303	290	278	294	1524	388	85	55	86	54	77	-0.051	14.88	2.08
79	12.966	13.694	0.16	0.17	2.25	83	0.2	1.79	82	-3.6	104	0.080	104	105	11.3	-0.2	360	240	306	289	278	295	1526	388	85	55	85	55	77	-0.051	14.9	2.31
80	13.131	13.869	0.17	0.17	2.25	83	-0.04	1.79	82	-3.4	103	0.080	105	106	11.1	-0.1	364	241	309	288	277	296	1523	386	85	55	85	55	77	-0.050	14.88	2.5
81	13.296	14.043	0.16	0.17	2.24	83	0.44	1.79	82	-3.3	102	0.080	105	105	11.1	-0.1	366	241	311	288	277	297	1528	384	85	56	85	55	77	-0.050	14.76	2.3
82	13.460	14.217	0.16	0.17	2.23	83	-0.08	1.80	82	-3.5	103	0.090	98	99	10.9	-0.1	370	241	314	289	277	298	1535	382	85	56	85	55	77	-0.050	14.79	1.84
83	13.624	14.392	0.16	0.17	2.25	83	-0.1	1.79	82	-3.3	103	0.080	104	106	10.8	-0.2	374	242	316	288	276	299	1544	380	85	56	85	55	77	-0.050	14.67	1.64
84	13.789	14.566	0.16	0.17	2.25	83	-0.06	1.78	81	-3.5	103	0.090	99	100	10.7	-0.1	375	242	319	288	276	300	1538	379	85	56	84	55	77	-0.049	14.62	1.34
85	13.954	14.741	0.17	0.17	2.25	83	0.05	1.79	81	-3.6	102	0.090	99	100	10.6	-0.1	379	243	321	288	276	301	1540	378	85	56	85	55	78	-0.049	14.62	0.94
86	14.118	14.915	0.16	0.17	2.23	83	0.45	1.79	81	-3.3	102	0.090	98	99	10.5	-0.1	383	243	323	287	276	302	1539	377	85	56	85	55	77	-0.049	14.49	1.02
87	14.282	15.089	0.16	0.17	2.23	83	-0.05	1.79	81	-3.4	102	0.080	104	105	10.3	-0.2	384	244	325	287	275	303	1541	377	85	56	85	55	78	-0.049	14.37	1.17
88	14.447	15.264	0.16	0.17	2.24	83	0.44	1.79	81	-3.3	103	0.090	99	100	10.3	-0.1	384	244	327	286	275	303	1545	377	85	56	85	55	77	-0.050	14.45	1.03
89	14.611	15.438	0.16	0.17	2.23	83	-0.1	1.79	81	-3.5	102	0.090	98	99	10.1	-0.1	384	244	329	286	275	304	1544	379	85	56	86	55	77	-0.050	14.64	1.02
90	14.775	15.613	0.16	0.17	2.24	83	0.32	1.78	81	-3.5	102	0.090	98	100	10.0	-0.2	385	245	331	286	275	304	1546	378	85	56	86	55	78	-0.049	14.75	1.16
91	14.939	15.787	0.16	0.17	2.24	83	0.45	1.78	81	-3.6	102	0.080	104	105	9.9	-0.1	387	245	333	286	275	305	1549	378	84	56	86	56	78	-0.049	14.83	1.2
92	15.105	15.961	0.17	0.17	2.24	83	0.03	1.78	81	-3.3	102	0.090	100	99	9.8	-0.1	389	245	335	286	275	306	1546	376	84	56	86	56	78	-0.049	14.8	1.08
93	15.268	16.135	0.16	0.17	2.22	83	0.42	1.79	81	-3.5	102	0.080	104	105	9.7	-0.1	390	246	337	286	275	307	1538	374	84	56	86	56	78	-0.049	14.85	0.96
94	15.432	16.309	0.16	0.17	2.24	83	0.05	1.79	81	-3.3	102	0.090	98	99	9.6	-0.1	391	246	340	286	275	308	1538	371	84	57	86	56	77	-0.048	14.81	0.78
95	15.597	16.483	0.16	0.17	2.23	83	0.09	1.78	81	-3.3	102	0.090	99	99	9.5	-0.1	392	246	343	285	275	308	1529	371	84	57	86	56	77	-0.048	14.74	0.63
96	15.762	16.657	0.17	0.17	2.23	83	0.28	1.79	81	-3.3	101	0.090	99	99	9.4	-0.1	393	246	345	284	275	309	1535	370	83	57	86	56	78	-0.048	14.69	0.47
97	15.926	16.832	0.16	0.18	2.25	83	0.29	1.78	81	-3.4	101	0.090	98	100	9.3	-0.1	394	247	348	284	275	310	1529	368	83	57	86	56	77	-0.048	14.6	0.32
98	16.092	17.005	0.17	0.17	2.27	83	0.15	1.78	81	-3.3	101	0.080	105	105	9.2	0.0	394	247	350	283	274	310	1502	367	83	57	85	56	77	-0.047	14.44	0.18
99	16.257	17.180	0.17	0.18	2.25	83	-0.11	1.78	81	-3.3	101	0.090	99	100	9.2	-0.1	395	248	353	283	274	311	1500	365	83	57	85	56	77	-0.047	14.24	0.14
100	16.422	17.353	0.16	0.17	2.25	83	-0.09	1.79	81	-3.3	101	0.090	99	99	9.0	-0.1	396	248	355	282	275	311	1492	363	83	57	85	56	77	-0.047	14.04	0.1
101	16.587	17.527	0.16	0.17	2.26	83	0.11	1.79	81	-3.5	100	0.080	105	105	9.0	-0.1	397	248	357	281	274	311	1504	363	84	57	85	56	77	-0.048	14.02	0.08
102	16.752	17.701	0.16	0.17	2.27	83	0.43	1.78	81	-3.4	100	0.080	105	105	8.8	-0.1	398	248	359	281	274	312	1503	363	84	57	85	56	77	-0.047	13.96	0.07
103	16.918	17.875	0.17	0.17	2.24	83	-0.04	1.79	81	-3.5	101	0.090	99	99	8.7	-0.1	400	248	361	280	274	313	1507	363	84	57	84	56	77	-0.047	14.03	0.08
104	17.082	18.050	0.16	0.18	2.25	83	-0.03	1.78	81	-3.4	100	0.090	98	100	8.6	-0.1	401	248	363	280	274	313	1505	361	84	57	84	57	77	-0.046	14.02	0.06
105	17.247	18.224	0.16	0.17	2.26	83	-0.1	1.78	81	-3.3	100	0.090	99	99	8.6	0.0	403	248	365	280	274	314	1505	361	85	57	85	57	77	-0.047	13.98	0.08
106	17.411	18.398	0.16	0.17	2.26	83	0.23	1.78	81	-3.3	100	0.080	104	105	8.5	-0.2	404	249	367	279	273	314	1517	363	85	57	85	57	76	-0.047	13.95	0.09
107	17.577	18.572	0.17	0.17	2.24	83	0.03	1.79	81	-3.4	99	0.090	99	99	8.5	0.0	408	249	369	279	273	316	1542	363	85	57	85	57	76	-0.047	14.05	0.11
108	17.742	18.746	0.16	0.17	2.25	83	0.36	1.78	81	-3.6	100	0.090	99	99	8.3	-0.2	413	250	370	278	273	317	1551	367	85	57	85	57	77	-0.049	14.22	0.18
109	17.906	18.920	0.16	0.17	2.26	83	0.42	1.78	81	-3.3	100	0.080	104	105	8.2	-0.1	417	250	371	278	273	318	1569	365	85	57	85	57	77	-0.047	14.38	0.13
110	18.071	19.094	0.17	0.17	2.26	83	0.09	1.79	81	-3.6	100	0.090	99	99	8.1	-0.1	420	250	372	278	273	319	1537	366	85	57	86	57	77	-0.048	14.36	0.21

Wood Heater Test Data

7

Run: 2

Manufacturer: Hearth & Home
Model: Dauntless NC
Tracking No.: 2389
Project No.: 061WS104E
Test Date: 04-Oct-19
Beginning Clock Time: 13:58

Total Sampling Time: 480 min
Recording Interval: 1 min
Background Sample Volume: _____ cubic feet

Meter Box Y Factor: 0.992 (1) 0.989 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	29.63		29.76	29.70 0

OMNI Equipment Numbers: _____

PM Control Modules: 371, 372
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.284 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 19.19 ft/sec.
Initial Tunnel Flow: 209.9 acfm
Average Tunnel Flow: 211.0 acfm
Post-Test Leak Check (1): 0.000 cfm @ 8 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ 6 in. Hg
Average Test Piece Fuel Moisture: 22.67 Dry Basis %

Technician Signature: _____

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.074	0.084	0.080	0.072	0.072	0.080	0.082	0.076	0.086	"H2O
Temp:	79	79	79	79	79	79	79	79	79	°F

V_{straw} 18.84 ft/sec V_{scent} 19.74 ft/sec F_p 0.955

	Particulate Sampling Data													Fuel Weight (lb)		Temperature Data (°F)											Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst Exit	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
111	18.236	19.268	0.16	0.17	2.25	83	-0.03	1.78	81	-3.4	99	0.090	99	99	8.0	-0.1	423	251	374	278	273	320	1565	366	85	58	86	57	77	-0.047	14.38	0.36
112	18.401	19.441	0.16	0.17	2.25	83	-0.1	1.79	81	-3.4	100	0.080	105	105	7.9	-0.1	429	252	375	279	273	322	1539	365	85	58	86	57	77	-0.047	14.5	0.44
113	18.565	19.616	0.16	0.18	2.26	83	0.38	1.78	81	-3.5	100	0.080	104	106	7.9	0.0	430	252	377	279	273	322	1524	366	84	58	86	57	77	-0.047	14.63	0.47
114	18.730	19.789	0.16	0.17	2.26	83	0.44	1.79	81	-3.5	100	0.080	105	105	7.7	-0.1	432	253	378	280	273	323	1515	363	84	58	86	57	78	-0.047	14.61	0.42
115	18.895	19.964	0.16	0.17	2.23	83	0.25	1.78	81	-3.3	100	0.080	105	106	7.7	-0.1	433	254	380	280	272	324	1499	363	84	58	86	57	78	-0.047	14.65	0.32
116	19.060	20.137	0.16	0.17	2.26	83	-0.09	1.78	81	-3.5	99	0.090	99	99	7.5	-0.1	435	255	383	280	272	325	1475	362	84	58	85	57	77	-0.046	14.56	0.24
117	19.224	20.311	0.16	0.17	2.26	83	0.42	1.78	81	-3.4	99	0.090	98	99	7.5	-0.1	437	256	385	280	272	326	1458	359	84	58	85	57	77	-0.045	14.36	0.17
118	19.390	20.485	0.17	0.17	2.26	83	0.44	1.79	81	-3.6	99	0.090	99	99	7.4	-0.1	439	256	388	280	272	327	1448	356	83	58	85	58	77	-0.045	14.08	0.12
119	19.555	20.659	0.16	0.17	2.23	82	0.31	1.78	81	-3.5	100	0.090	99	99	7.3	-0.1	441	257	390	279	272	328	1431	354	83	58	85	58	77	-0.044	13.88	0.09
120	19.719	20.833	0.16	0.17	2.25	82	0.15	1.78	81	-3.6	99	0.080	104	105	7.2	-0.1	443	258	393	278	273	329	1397	352	83	58	85	58	77	-0.045	13.67	0.06
121	19.883	21.007	0.16	0.17	2.26	82	0.26	1.79	81	-3.3	99	0.080	104	105	7.1	0.0	445	258	394	277	272	329	1388	350	83	58	85	58	76	-0.042	13.43	0.08
122	20.049	21.181	0.17	0.17	2.26	82	-0.1	1.79	81	-3.5	99	0.090	99	99	7.1	0.0	447	259	396	274	273	330	1384	348	83	58	85	58	76	-0.045	13.14	0.13
123	20.214	21.354	0.16	0.17	2.25	82	0.39	1.79	81	-3.6	99	0.080	105	105	7.0	-0.1	449	260	398	273	272	330	1365	348	83	58	85	58	77	-0.044	12.83	0.23
124	20.379	21.529	0.17	0.18	2.26	82	-0.11	1.78	81	-3.4	99	0.080	105	106	7.0	0.0	451	261	399	270	272	331	1364	346	83	58	85	58	77	-0.043	12.73	0.26
125	20.543	21.702	0.16	0.17	2.26	82	0.43	1.79	81	-3.6	98	0.090	98	98	6.8	-0.1	454	261	400	270	272	331	1368	345	83	58	85	58	77	-0.040	12.59	0.32
126	20.709	21.877	0.17	0.17	2.26	82	0.15	1.78	81	-3.5	98	0.090	99	100	6.8	-0.1	457	262	401	268	272	332	1363	343	84	58	85	58	77	-0.043	12.47	0.37
127	20.873	22.050	0.16	0.17	2.24	82	0.2	1.77	81	-3.3	98	0.090	98	98	6.7	0.0	460	262	402	266	272	332	1363	342	84	58	86	58	78	-0.044	12.36	0.35
128	21.038	22.224	0.16	0.17	2.25	82	-0.11	1.78	80	-3.3	98	0.090	99	99	6.6	-0.1	462	263	402	266	272	333	1357	342	84	58	86	58	77	-0.044	12.25	0.34
129	21.202	22.398	0.16	0.17	2.26	82	0.42	1.79	80	-3.6	98	0.090	98	99	6.6	-0.1	467	264	403	264	271	334	1357	341	85	58	86	58	77	-0.040	12.37	0.33
130	21.368	22.572	0.17	0.17	2.25	82	-0.01	1.78	80	-3.5	98	0.090	99	99	6.4	-0.1	470	264	403	263	271	334	1356	341	85	58	86	58	78	-0.043	12.51	0.31
131	21.532	22.746	0.16	0.17	2.24	82	0.39	1.78	80	-3.5	98	0.080	104	105	6.4	0.0	474	265	403	262	271	335	1355	341	85	58	86	58	78	-0.044	12.51	0.32
132	21.696	22.919	0.16	0.17	2.25	82	0.16	1.79	80	-3.3	98	0.080	104	105	6.4	0.0	479	266	403	261	270	336	1351	341	85	58	86	58	77	-0.043	12.66	0.35
133	21.861	23.093	0.16	0.17	2.24	82	-0.09	1.78	80	-3.5	98	0.090	99	99	6.2	-0.1	482	266	403	260	270	336	1347	340	85	59	85	58	77	-0.042	12.67	0.35
134	22.026	23.267	0.16	0.17	2.22	82	0.44	1.77	80	-3.3	98	0.090	99	99	6.2	0.0	484	267	403	260	270	337	1353	340	85	59	85	58	78	-0.042	12.59	0.37
135	22.190	23.441	0.16	0.17	2.24	82	0.06	1.77	80	-3.4	97	0.080	104	105	6.1	-0.1	486	268	403	259	270	337	1362	340	84	59	85	58	78	-0.044	12.65	0.29
136	22.354	23.614	0.16	0.17	2.25	82	-0.04	1.79	80	-3.3	97	0.080	104	105	6.0	0.0	489	269	404	259	270	338	1350	338	84	59	85	58	77	-0.039	12.6	0.27
137	22.519	23.789	0.16	0.18	2.25	82	0.04	1.78	80	-3.6	98	0.080	105	106	6.0	0.0	490	270	403	258	269	338	1333	337	84	59	85	58	78	-0.044	12.59	0.28
138	22.683	23.962	0.16	0.17	2.23	82	0.07	1.77	80	-3.6	98	0.090	98	99	5.9	-0.1	490	270	403	257	269	338	1291	333	84	59	84	58	77	-0.041	12.36	0.33
139	22.848	24.136	0.16	0.17	2.24	82	0.35	1.77	80	-3.6	97	0.090	99	99	5.8	0.0	489	271	403	255	269	337	1270	330	84	59	84	59	77	-0.041	11.97	0.37
140	23.012	24.310	0.16	0.17	2.25	82	-0.11	1.78	80	-3.4	97	0.090	98	99	5.8	0.0	488	271	402	254	268	337	1260	327	83	59	85	59	77	-0.042	11.53	0.47
141	23.177	24.484	0.16	0.17	2.24	82	0.44	1.78	80	-3.3	96	0.090	99	99	5.7	-0.1	487	271	401	252	268	336	1252	325	83	59	85	59	77	-0.040	11.18	0.54
142	23.341	24.657	0.16	0.17	2.24	82	0.16	1.77	80	-3.4	97	0.090	98	99	5.7	0.0	488	272	400	250	268	336	1237	324	83	59	85	59	77	-0.042	10.92	0.53
143	23.506	24.831	0.16	0.17	2.26	82	0.16	1.78	80	-3.6	97	0.080	105	105	5.7	0.0	490	272	399	248	268	335	1232	322	83	59	85	59	77	-0.039	10.83	0.51
144	23.671	25.005	0.16	0.17	2.24	82	-0.04	1.79	80	-3.5	96	0.090	99	99	5.5	-0.1	490	272	398	246	267	335	1236	320	83	59	85	59	77	-0.041	10.81	0.53
145	23.835	25.178	0.16	0.17	2.23	82	0.22	1.78	80	-3.3	96	0.090	98	98	5.5	0.0	490	272	396	244	267	334	1234	319	83	59	85	59	78	-0.040	10.78	0.49
146	23.999	25.353	0.16	0.18	2.24	82	0.34	1.78	80	-3.6	96	0.090	98	100	5.5	0.0	491	273	395	243	267	334	1225	318	83	59	86	59	77	-0.040	10.78	0.5
147	24.163	25.526	0.16	0.17	2.25	82	-0.12	1.78	80	-3.4	95	0.080	104	104	5.4	0.0	493	273	394	242	267	334	1214	317	83	59	86	59	78	-0.039	10.81	0.49

Wood Heater Test Data

7

Run: 2

Manufacturer: Hearth & Home
Model: Dauntless NC
Tracking No.: 2389
Project No.: 061WS104E
Test Date: 04-Oct-19
Beginning Clock Time: 13:58

Total Sampling Time: 480 min
Recording Interval: 1 min
Background Sample Volume: _____ cubic feet

Meter Box Y Factor: 0.992 (1) 0.989 (2) _____ (Amb)

Barometric Pressure:

Begin	Middle	End	Average
29.63		29.76	29.70 0

OMNI Equipment Numbers: _____

PM Control Modules: 371, 372
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.284 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 19.19 ft/sec.
Initial Tunnel Flow: 209.9 acfm
Average Tunnel Flow: 211.0 acfm
Post-Test Leak Check (1): 0.000 cfm @ 8 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ 6 in. Hg
Average Test Piece Fuel Moisture: 22.67 Dry Basis %

Technician Signature: _____

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.074	0.084	0.080	0.072	0.072	0.080	0.082	0.076	0.086	"H2O
Temp:	79	79	79	79	79	79	79	79	79	°F

V_{straw} 18.84 ft/sec V_{scent} 19.74 ft/sec F_p 0.955

	Particulate Sampling Data													Fuel Weight (lb)		Temperature Data (°F)											Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst Exit	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
148	24.328	25.700	0.16	0.17	2.25	82	0.3	1.78	80	-3.4	95	0.080	104	105	5.3	-0.1	494	273	393	240	266	333	1222	317	84	59	85	59	77	-0.039	10.87	0.51
149	24.492	25.873	0.16	0.17	2.23	82	0.31	1.78	80	-3.5	96	0.090	98	98	5.3	0.0	494	274	392	239	267	333	1234	317	84	59	85	59	78	-0.039	10.86	0.52
150	24.656	26.047	0.16	0.17	2.25	82	-0.12	1.78	80	-3.6	96	0.090	98	99	5.3	0.0	494	274	391	238	266	333	1236	317	84	59	85	59	78	-0.039	10.91	0.52
151	24.821	26.220	0.17	0.17	2.23	82	0.4	1.78	80	-3.6	96	0.080	105	104	5.2	-0.1	495	274	390	238	266	333	1233	316	84	59	85	59	78	-0.040	10.98	0.52
152	24.985	26.395	0.16	0.18	2.22	82	0.04	1.77	80	-3.3	95	0.090	98	100	5.1	-0.1	495	274	389	237	266	332	1231	315	84	59	85	59	78	-0.039	11.05	0.52
153	25.149	26.568	0.16	0.17	2.23	82	0.13	1.77	80	-3.6	96	0.090	98	98	5.1	0.0	496	274	387	236	266	332	1242	317	84	59	85	59	78	-0.039	11.12	0.53
154	25.313	26.742	0.16	0.17	2.24	82	0.4	1.78	80	-3.3	95	0.090	98	99	5.0	-0.1	496	275	388	235	266	332	1242	316	84	59	85	59	78	-0.039	11.2	0.5
155	25.477	26.915	0.16	0.17	2.23	82	-0.09	1.78	80	-3.4	95	0.090	98	98	4.9	0.0	494	275	386	235	266	331	1270	318	84	59	85	59	78	-0.039	11.31	0.52
156	25.641	27.089	0.16	0.17	2.23	82	0.42	1.77	80	-3.4	95	0.090	98	99	4.9	-0.1	493	275	386	235	265	331	1280	318	84	59	85	59	78	-0.040	11.61	0.43
157	25.805	27.262	0.16	0.17	2.25	82	0.43	1.77	80	-3.5	95	0.080	104	104	4.8	-0.1	491	275	385	235	265	330	1286	321	84	59	85	59	78	-0.043	11.73	0.41
158	25.970	27.436	0.16	0.17	2.23	82	0.34	1.78	80	-3.3	95	0.080	104	105	4.7	0.0	491	275	384	235	265	330	1292	324	84	59	85	59	77	-0.038	12.04	0.34
159	26.133	27.609	0.16	0.17	2.22	82	-0.09	1.78	80	-3.6	95	0.080	103	104	4.7	0.0	489	275	383	236	265	330	1288	323	84	59	85	59	77	-0.040	12.09	0.35
160	26.297	27.783	0.16	0.17	2.24	82	0.26	1.78	80	-3.3	95	0.080	104	105	4.7	0.0	488	275	383	236	265	329	1297	323	84	59	85	59	78	-0.040	12.03	0.34
161	26.461	27.957	0.16	0.17	2.23	82	0.01	1.77	80	-3.4	95	0.090	98	99	4.5	-0.1	485	275	381	236	265	328	1284	324	83	59	85	60	78	-0.041	12.04	0.3
162	26.625	28.130	0.16	0.17	2.22	82	0.43	1.77	80	-3.6	95	0.090	98	98	4.5	0.0	482	276	381	236	264	328	1266	321	83	59	86	60	78	-0.039	11.91	0.28
163	26.789	28.304	0.16	0.17	2.23	82	0.11	1.78	80	-3.6	95	0.090	98	99	4.4	-0.1	480	276	379	236	264	327	1252	319	83	59	86	60	79	-0.040	11.69	0.29
164	26.953	28.477	0.16	0.17	2.24	82	0.02	1.78	80	-3.6	95	0.090	98	98	4.4	0.0	477	276	378	236	264	326	1245	318	83	59	85	60	78	-0.039	11.57	0.24
165	27.117	28.651	0.16	0.17	2.22	82	-0.06	1.78	80	-3.3	95	0.090	98	99	4.3	0.0	475	275	378	235	264	325	1221	317	83	60	85	60	78	-0.038	11.36	0.25
166	27.280	28.824	0.16	0.17	2.23	82	-0.11	1.78	80	-3.4	95	0.090	97	98	4.3	0.0	472	275	376	235	264	324	1221	316	83	60	85	60	78	-0.038	11.24	0.25
167	27.444	28.998	0.16	0.17	2.23	82	0.16	1.78	80	-3.4	95	0.080	104	105	4.2	-0.1	469	275	375	234	263	323	1220	315	83	60	85	60	78	-0.039	11.13	0.23
168	27.609	29.171	0.17	0.17	2.24	82	0.42	1.78	80	-3.5	95	0.090	98	98	4.2	0.0	467	275	374	233	264	323	1209	314	83	60	85	60	77	-0.038	11.11	0.18
169	27.772	29.345	0.16	0.17	2.23	82	0.21	1.77	80	-3.3	94	0.090	97	99	4.2	0.0	465	275	372	233	263	322	1192	312	83	60	85	60	78	-0.038	11.01	0.18
170	27.936	29.518	0.16	0.17	2.23	82	0.02	1.79	80	-3.3	95	0.080	104	104	4.1	-0.1	463	275	372	232	263	321	1188	311	84	60	85	60	77	-0.038	10.91	0.19
171	28.100	29.692	0.16	0.17	2.23	82	0.43	1.78	80	-3.3	95	0.090	98	99	4.1	0.0	461	275	370	231	263	320	1175	310	84	60	84	60	78	-0.037	10.72	0.23
172	28.264	29.865	0.16	0.17	2.22	82	-0.12	1.77	80	-3.4	94	0.080	104	104	4.0	-0.1	460	275	370	231	263	320	1164	308	84	60	85	60	78	-0.038	10.65	0.22
173	28.429	30.039	0.16	0.17	2.28	82	0.4	1.78	80	-3.5	94	0.090	98	99	4.0	0.0	459	275	369	230	263	319	1152	307	84	60	85	60	77	-0.037	10.53	0.26
174	28.594	30.212	0.17	0.17	2.28	82	0.08	1.79	80	-3.5	94	0.090	98	98	4.0	0.0	458	275	367	229	263	318	1138	306	84	60	85	60	77	-0.037	10.38	0.34
175	28.761	30.386	0.17	0.17	2.28	82	-0.15	1.78	80	-3.6	94	0.090	100	99	3.9	0.0	457	275	367	229	263	318	1129	304	84	60	85	60	77	-0.037	10.18	0.4
176	28.926	30.560	0.16	0.17	2.27	82	0	1.77	80	-3.3	94	0.090	98	99	3.8	-0.1	456	275	365	227	262	317	1120	302	84	60	85	60	78	-0.037	9.97	0.47
177	29.092	30.734	0.17	0.17	2.28	82	0.1	1.77	80	-3.3	93	0.090	99	99	3.8	0.0	455	275	365	226	262	317	1117	300	84	60	85	60	77	-0.036	9.78	0.56
178	29.257	30.906	0.17	0.17	2.29	82	0.4	1.78	80	-3.3	93	0.080	104	104	3.8	0.0	453	275	363	225	262	316	1107	299	84	60	85	60	77	-0.036	9.68	0.56
179	29.423	31.080	0.17	0.17	2.28	82	0.16	1.78	80	-3.4	93	0.090	99	99	3.8	0.0	451	275	362	224	262	315	1099	297	84	60	85	60	77	-0.036	9.54	0.59
180	29.589	31.254	0.17	0.17	2.28	82	-0.13	1.77	80	-3.5	93	0.090	99	99	3.7	-0.1	451	275	362	223	262	315	1088	294	84	60	85	60	77	-0.036	9.32	0.65
181	29.755	31.428	0.17	0.17	2.27	82	0.12	1.77	80	-3.3	92	0.080	105	105	3.6	0.0	451	275	361	221	262	314	1077	293	83	60	85	60	77	-0.035	9.2	0.68
182	29.920	31.601	0.17	0.17	2.29	82	-0.07	1.79	80	-3.5	93	0.090	98	98	3.6	0.0	449	275	360	220	262	313	1064	292	83	60	85	60	77	-0.035	9.12	0.71
183	30.085	31.774	0.16	0.17	2.29	82	-0.15	1.78	80	-3.3	93	0.090	98	98	3.6	0.0	448	275	359	219	262	313	1054	289	83	60	85	60	77	-0.035	9.01	0.72
184	30.252	31.948	0.17	0.17	2.27	82	-0.01	1.77	80	-3.5	93	0.080	106	105	3.6	0.0	448	275	359	218	262	312	1041	288	83	60	85	60	77	-0.034	8.88	0.72

Wood Heater Test Data

7

Run: 2

Manufacturer: Hearth & Home
Model: Dauntless NC
Tracking No.: 2389
Project No.: 061WS104E
Test Date: 04-Oct-19
Beginning Clock Time: 13:58

Total Sampling Time: 480 min
Recording Interval: 1 min
Background Sample Volume: ____ cubic feet

Meter Box Y Factor: 0.992 (1) 0.989 (2) ____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	29.63		29.76	29.70 0

OMNI Equipment Numbers: ____

PM Control Modules: 371, 372
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.284 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 19.19 ft/sec.
Initial Tunnel Flow: 209.9 acfm
Average Tunnel Flow: 211.0 scfm
Post-Test Leak Check (1): 0.000 cfm @ 8 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ 6 in. Hg
Average Test Piece Fuel Moisture: 22.67 Dry Basis %

Technician Signature: ____

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.074	0.084	0.080	0.072	0.072	0.080	0.082	0.076	0.086	"H2O
Temp:	79	79	79	79	79	79	79	79	79	°F

V_{straw} 18.84 ft/sec V_{scent} 19.74 ft/sec F_p 0.955

	Particulate Sampling Data													Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst Exit	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
185	30.417	32.121	0.17	0.17	2.27	82	0.29	1.78	80	-3.4	92	0.090	98	98	3.5	-0.1	447	275	357	216	262	311	1037	286	83	60	85	60	77	-0.034	8.79	0.73
186	30.583	32.294	0.17	0.17	2.28	82	-0.13	1.78	80	-3.6	92	0.080	105	104	3.5	0.0	445	275	357	215	262	311	1021	285	83	60	85	60	77	-0.034	8.72	0.76
187	30.748	32.468	0.17	0.17	2.29	81	-0.03	1.77	80	-3.6	92	0.090	98	99	3.4	0.0	444	275	356	214	262	310	1012	282	83	60	85	60	77	-0.033	8.63	0.77
188	30.915	32.642	0.17	0.17	2.29	82	0.16	1.77	80	-3.6	92	0.090	99	99	3.4	0.0	443	275	355	212	262	309	1006	281	83	60	85	61	77	-0.034	8.51	0.81
189	31.080	32.815	0.16	0.17	2.26	81	-0.15	1.78	80	-3.3	92	0.090	98	98	3.4	0.0	442	275	354	211	262	309	1000	280	83	60	85	61	77	-0.033	8.5	0.82
190	31.246	32.989	0.17	0.17	2.29	81	-0.08	1.78	80	-3.6	92	0.090	99	99	3.4	0.0	440	275	353	210	262	308	992	279	83	60	85	61	77	-0.033	8.41	0.81
191	31.412	33.162	0.17	0.17	2.29	81	-0.15	1.78	80	-3.3	92	0.090	99	98	3.3	-0.1	439	275	352	208	262	307	984	277	84	60	85	61	76	-0.032	8.18	0.83
192	31.577	33.336	0.17	0.17	2.30	81	0.26	1.77	80	-3.3	91	0.090	98	99	3.2	0.0	437	275	352	207	262	307	980	277	84	60	85	61	77	-0.032	8.16	0.83
193	31.744	33.510	0.17	0.17	2.30	81	0.16	1.78	80	-3.3	91	0.090	100	99	3.2	0.0	435	275	350	206	262	306	970	276	84	60	85	61	77	-0.032	8.19	0.82
194	31.910	33.684	0.17	0.17	2.28	81	0.41	1.79	80	-3.4	91	0.090	99	99	3.2	0.0	434	275	350	205	262	305	966	275	84	60	85	61	77	-0.032	8.18	0.82
195	32.076	33.857	0.17	0.17	2.30	81	-0.13	1.78	80	-3.3	91	0.080	105	104	3.2	0.0	433	275	349	204	262	305	964	274	84	60	85	61	77	-0.031	8.16	0.82
196	32.242	34.031	0.17	0.17	2.31	81	0.17	1.78	80	-3.3	91	0.090	99	99	3.2	0.0	431	275	348	203	262	304	969	275	84	60	85	61	76	-0.032	8.17	0.83
197	32.409	34.204	0.17	0.17	2.30	81	0.25	1.79	80	-3.4	91	0.090	100	98	3.1	-0.1	430	275	347	202	262	303	966	274	84	60	85	61	77	-0.032	8.25	0.81
198	32.575	34.378	0.17	0.17	2.30	81	-0.04	1.79	80	-3.3	91	0.080	105	105	3.0	0.0	429	274	346	201	262	302	980	275	84	60	85	61	77	-0.033	8.25	0.81
199	32.741	34.552	0.17	0.17	2.30	81	0.41	1.78	79	-3.3	91	0.090	99	99	3.0	0.0	428	275	346	200	262	302	978	275	84	60	85	61	76	-0.032	8.33	0.8
200	32.907	34.726	0.17	0.17	2.31	81	-0.12	1.78	80	-3.5	91	0.080	105	105	3.0	0.0	427	274	344	200	261	301	976	275	83	60	85	61	76	-0.032	8.46	0.78
201	33.074	34.899	0.17	0.17	2.31	81	0.08	1.79	80	-3.3	91	0.090	100	98	2.9	-0.1	425	275	344	199	261	301	970	274	83	60	85	61	77	-0.032	8.51	0.79
202	33.241	35.073	0.17	0.17	2.31	81	0.28	1.77	79	-3.3	91	0.090	100	99	2.9	0.0	425	274	343	198	261	300	967	274	83	60	85	61	77	-0.032	8.55	0.79
203	33.408	35.247	0.17	0.17	2.30	81	0.31	1.78	80	-3.4	91	0.090	100	99	2.9	0.0	424	274	342	198	261	300	971	275	83	61	85	61	77	-0.032	8.51	0.8
204	33.574	35.420	0.17	0.17	2.29	81	0.33	1.79	80	-3.3	91	0.080	105	104	2.8	0.0	423	274	341	197	260	299	963	274	83	61	85	61	77	-0.032	8.55	0.77
205	33.740	35.593	0.17	0.17	2.31	81	0.15	1.79	79	-3.3	91	0.080	105	104	2.8	0.0	422	274	341	197	260	299	959	273	82	61	85	61	77	-0.031	8.6	0.76
206	33.907	35.767	0.17	0.17	2.31	81	-0.11	1.78	79	-3.4	91	0.090	100	99	2.7	-0.1	422	274	340	196	260	298	971	273	83	61	85	61	76	-0.032	8.55	0.81
207	34.073	35.941	0.17	0.17	2.31	81	0.04	1.78	79	-3.5	91	0.090	99	99	2.7	0.0	421	274	339	196	260	298	970	274	83	61	85	61	77	-0.031	8.54	0.82
208	34.241	36.114	0.17	0.17	2.31	81	0.11	1.79	80	-3.5	91	0.090	100	98	2.7	0.0	422	274	339	195	260	298	979	275	83	61	85	61	76	-0.033	8.55	0.81
209	34.407	36.288	0.17	0.17	2.30	81	0.25	1.79	79	-3.3	91	0.090	99	99	2.6	0.0	423	275	338	195	259	298	974	275	83	61	85	61	77	-0.032	8.7	0.76
210	34.573	36.462	0.17	0.17	2.30	81	0.1	1.78	79	-3.3	90	0.090	99	99	2.6	0.0	424	275	338	195	259	298	966	275	83	61	85	61	77	-0.032	8.79	0.67
211	34.740	36.636	0.17	0.17	2.31	81	0.39	1.78	79	-3.3	90	0.090	99	99	2.5	-0.1	426	275	337	194	259	298	953	273	84	61	85	61	77	-0.031	8.66	0.69
212	34.906	36.809	0.17	0.17	2.31	81	0.32	1.79	79	-3.4	90	0.090	99	98	2.5	0.0	428	275	337	194	258	298	939	270	84	61	85	61	77	-0.031	8.45	0.77
213	35.074	36.983	0.17	0.17	2.32	81	0.19	1.79	79	-3.5	90	0.090	100	99	2.5	0.0	428	275	336	193	258	298	916	267	84	61	85	61	77	-0.032	8.03	0.81
214	35.240	37.156	0.17	0.17	2.29	81	0.21	1.78	79	-3.3	90	0.080	105	104	2.5	0.0	427	275	336	192	258	298	897	264	84	61	85	61	78	-0.030	7.69	0.88
215	35.406	37.330	0.17	0.17	2.30	81	-0.07	1.78	79	-3.3	90	0.090	99	99	2.5	0.0	425	275	335	191	258	297	881	262	84	61	85	61	76	-0.030	7.47	0.91
216	35.572	37.503	0.17	0.17	2.31	81	0.26	1.79	79	-3.6	90	0.090	99	98	2.4	0.0	423	275	334	190	257	296	867	259	84	61	85	61	77	-0.029	7.28	0.91
217	35.739	37.678	0.17	0.17	2.32	81	0.36	1.79	79	-3.3	90	0.090	99	99	2.4	0.0	420	275	334	189	257	295	858	257	84	61	85	61	77	-0.029	7.11	0.92
218	35.906	37.851	0.17	0.17	2.29	81	-0.12	1.78	79	-3.3	90	0.090	99	98	2.3	-0.1	418	275	333	188	257	294	849	255	84	61	85	61	77	-0.028	6.97	0.91
219	36.073	38.025	0.17	0.17	2.31	81	0.26	1.78	79	-3.4	89	0.090	99	99	2.3	0.0	417	275	332	187	257	294	837	253	83	61	85	61	77	-0.028	6.96	0.88
220	36.239	38.198	0.17	0.17	2.31	81	0.18	1.79	79	-3.3	89	0.090	99	98	2.3	0.0	416	275	331	186	256	293	822	251	83	61	85	61	77	-0.028	6.89	0.84
221	36.406	38.372	0.17	0.17	2.31	81	-0.07	1.78	79	-3.5	89	0.080	105	105	2.3	0.0	414	275	331	184	256	292	810	249	83	61	85	61	77	-0.027	6.76	0.84

Wood Heater Test Data

7

Run: 2

Manufacturer: Hearth & Home
Model: Dauntless NC
Tracking No.: 2389
Project No.: 061WS104E
Test Date: 04-Oct-19
Beginning Clock Time: 13:58

Total Sampling Time: 480 min
Recording Interval: 1 min
Background Sample Volume: _____ cubic feet

Meter Box Y Factor: 0.992 (1) 0.989 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	29.63		29.76	29.70 0

OMNI Equipment Numbers: _____

PM Control Modules: 371, 372
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.284 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 19.19 ft/sec.
Initial Tunnel Flow: 209.9 acfm
Average Tunnel Flow: 211.0 scfm
Post-Test Leak Check (1): 0.000 cfm @ 8 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ 6 in. Hg
Average Test Piece Fuel Moisture: 22.67 Dry Basis %

Technician Signature: _____

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.074	0.084	0.080	0.072	0.072	0.080	0.082	0.076	0.086	"H2O
Temp:	79	79	79	79	79	79	79	79	79	°F

V_{straw} 18.84 ft/sec V_{scent} 19.74 ft/sec F_p 0.955

	Particulate Sampling Data													Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst Exit	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
222	36.573	38.546	0.17	0.17	2.31	81	0.16	1.78	79	-3.3	89	0.090	99	99	2.3	0.0	413	275	330	183	256	291	798	247	83	61	85	61	77	-0.027	6.56	0.87
223	36.739	38.720	0.17	0.17	2.32	81	-0.06	1.78	79	-3.4	89	0.090	99	99	2.3	0.0	412	275	330	181	256	291	788	245	83	61	85	61	77	-0.027	6.43	0.86
224	36.907	38.894	0.17	0.17	2.32	81	0.37	1.79	79	-3.4	89	0.090	100	99	2.3	0.0	411	275	329	180	255	290	778	244	82	61	85	61	77	-0.027	6.34	0.86
225	37.074	39.068	0.17	0.17	2.30	81	-0.13	1.79	79	-3.3	89	0.090	99	99	2.3	0.0	410	275	328	178	255	289	770	242	82	61	85	62	78	-0.026	6.27	0.86
226	37.240	39.242	0.17	0.17	2.32	81	-0.03	1.79	79	-3.6	89	0.090	99	99	2.2	-0.1	408	275	328	177	255	289	760	239	83	61	85	62	77	-0.026	6.2	0.85
227	37.407	39.416	0.17	0.17	2.32	81	-0.08	1.80	79	-3.3	89	0.090	99	99	2.2	0.0	407	275	327	176	254	288	754	238	83	61	85	62	77	-0.026	6.14	0.84
228	37.573	39.590	0.17	0.17	2.32	81	0.15	1.79	79	-3.3	89	0.090	99	99	2.2	0.0	406	275	326	175	254	287	744	236	83	61	85	62	77	-0.025	6.12	0.85
229	37.741	39.764	0.17	0.17	2.30	81	-0.01	1.79	79	-3.6	89	0.090	100	99	2.1	0.0	404	275	325	173	253	286	736	235	83	61	85	62	77	-0.025	6.09	0.85
230	37.908	39.939	0.17	0.17	2.32	81	0.1	1.79	79	-3.3	88	0.090	99	99	2.1	0.0	403	275	325	172	253	286	730	233	83	61	85	62	77	-0.024	6.02	0.84
231	38.075	40.112	0.17	0.17	2.31	81	-0.04	1.80	79	-3.4	88	0.090	99	98	2.1	0.0	402	275	324	171	253	285	723	232	84	61	85	62	77	-0.024	5.98	0.84
232	38.241	40.287	0.17	0.17	2.31	81	0.29	1.80	79	-3.3	88	0.090	99	99	2.1	0.0	400	275	323	170	252	284	717	230	84	61	85	62	76	-0.024	5.91	0.83
233	38.408	40.461	0.17	0.17	2.32	81	0.4	1.79	79	-3.6	88	0.090	99	99	2.1	0.0	399	275	322	168	252	283	710	229	84	61	85	62	76	-0.024	5.91	0.83
234	38.575	40.635	0.17	0.17	2.32	81	0.42	1.80	79	-3.3	88	0.090	99	99	2.1	0.0	398	275	322	167	251	283	704	228	84	61	85	62	75	-0.023	5.9	0.84
235	38.743	40.810	0.17	0.18	2.32	81	-0.09	1.79	79	-3.3	89	0.080	106	105	2.1	0.0	396	275	321	166	251	282	701	226	84	61	85	62	75	-0.023	5.9	0.83
236	38.909	40.984	0.17	0.17	2.29	81	0.38	1.79	79	-3.3	88	0.090	99	99	2.1	0.0	396	275	320	164	251	281	697	225	84	61	85	62	75	-0.023	5.86	0.82
237	39.075	41.158	0.17	0.17	2.30	81	0.27	1.78	79	-3.4	89	0.090	99	99	2.1	0.0	395	274	319	163	250	280	693	223	83	61	85	62	75	-0.023	5.83	0.8
238	39.242	41.332	0.17	0.17	2.32	81	-0.05	1.80	79	-3.3	89	0.080	105	105	2.0	-0.1	393	274	318	162	250	279	688	222	83	61	85	62	76	-0.022	5.8	0.81
239	39.408	41.506	0.17	0.17	2.32	81	-0.12	1.80	79	-3.4	89	0.090	99	99	2.0	0.0	393	275	317	161	249	279	686	220	83	61	85	62	76	-0.022	5.9	0.82
240	39.576	41.681	0.17	0.17	2.30	81	0.41	1.80	79	-3.4	88	0.080	106	105	2.0	0.0	391	274	316	160	249	278	680	219	83	61	85	62	77	-0.022	5.9	0.81
241	39.743	41.855	0.17	0.17	2.32	81	0.31	1.80	79	-3.5	87	0.090	99	98	1.9	0.0	389	274	315	160	248	277	677	219	83	61	85	62	76	-0.022	5.91	0.82
242	39.909	42.030	0.17	0.18	2.31	81	-0.09	1.80	79	-3.6	88	0.080	105	105	1.9	0.0	388	274	314	159	248	277	670	217	82	61	85	62	76	-0.022	5.87	0.82
243	40.076	42.204	0.17	0.17	2.31	81	0.28	1.79	79	-3.4	88	0.090	99	99	1.9	0.0	387	274	314	158	248	276	666	216	82	61	85	62	77	-0.021	5.86	0.83
244	40.243	42.379	0.17	0.17	2.32	81	0.42	1.80	79	-3.5	88	0.090	99	99	1.9	0.0	386	274	313	157	247	275	663	215	82	61	85	62	76	-0.021	5.83	0.83
245	40.410	42.553	0.17	0.17	2.31	81	0.42	1.80	79	-3.3	88	0.080	105	105	1.9	0.0	385	273	311	156	246	274	659	214	82	61	85	62	77	-0.021	5.81	0.83
246	40.577	42.728	0.17	0.18	2.32	81	-0.01	1.79	79	-3.6	88	0.080	105	105	1.9	0.0	383	274	311	155	246	274	655	213	83	61	85	62	76	-0.021	5.76	0.81
247	40.744	42.902	0.17	0.17	2.29	81	0.01	1.80	79	-3.4	87	0.090	99	98	1.9	0.0	382	274	309	154	246	273	651	212	83	62	85	62	76	-0.020	5.74	0.79
248	40.910	43.077	0.17	0.17	2.31	81	-0.13	1.80	79	-3.4	87	0.090	99	99	1.9	0.0	380	274	308	154	245	272	646	211	83	61	85	62	76	-0.021	5.69	0.78
249	41.077	43.251	0.17	0.17	2.32	81	0.34	1.80	79	-3.3	87	0.090	99	98	1.9	0.0	379	274	307	153	245	272	641	210	83	62	85	62	77	-0.021	5.69	0.77
250	41.243	43.426	0.17	0.18	2.32	81	0.25	1.80	79	-3.5	87	0.080	105	105	1.9	0.0	379	274	307	153	244	271	636	209	84	62	85	62	76	-0.020	5.64	0.76
251	41.411	43.600	0.17	0.17	2.31	81	-0.12	1.80	79	-3.4	87	0.090	100	98	1.9	0.0	377	273	306	151	244	270	633	208	84	62	85	62	76	-0.020	5.59	0.75
252	41.578	43.775	0.17	0.17	2.29	81	0.4	1.79	79	-3.3	87	0.090	99	99	1.9	0.0	376	273	305	151	244	270	630	207	84	62	85	62	76	-0.020	5.59	0.76
253	41.744	43.949	0.17	0.17	2.31	81	-0.05	1.80	79	-3.4	87	0.090	99	98	1.8	-0.1	375	273	304	150	243	269	624	206	84	62	85	62	76	-0.019	5.6	0.76
254	41.911	44.123	0.17	0.17	2.31	81	0.11	1.81	79	-3.4	87	0.090	99	98	1.8	0.0	373	272	302	149	243	268	620	205	84	62	85	62	77	-0.019	5.58	0.76
255	42.078	44.298	0.17	0.18	2.32	81	0.4	1.81	79	-3.5	87	0.090	99	99	1.8	0.0	373	272	302	149	242	268	616	204	83	62	85	62	77	-0.019	5.55	0.76
256	42.245	44.472	0.17	0.17	2.31	81	-0.02	1.80	79	-3.3	86	0.090	99	98	1.8	0.0	370	272	301	149	242	267	613	203	83	62	85	62	77	-0.019	5.52	0.75
257	42.412	44.648	0.17	0.18	2.32	81	0.05	1.80	79	-3.4	87	0.090	99	100	1.7	0.0	369	272	300	148	241	266	610	202	83	62	85	62	77	-0.019	5.52	0.73
258	42.578	44.822	0.17	0.17	2.29	81	0.18	1.80	80	-3.3	86	0.090	98	98	1.7	0.0	368	272	299	148	241	266	606	201	83	62	85	62	76	-0.018	5.52	0.72

Wood Heater Test Data

7

Run: 2

Manufacturer: Hearth & Home
Model: Dauntless NC
Tracking No.: 2389
Project No.: 061WS104E
Test Date: 04-Oct-19
Beginning Clock Time: 13:58

Total Sampling Time: 480 min
Recording Interval: 1 min
Background Sample Volume: _____ cubic feet

Meter Box Y Factor: 0.992 (1) 0.989 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	29.63		29.76	29.70 0

OMNI Equipment Numbers: _____

PM Control Modules: 371, 372
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.284 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 19.19 ft/sec.
Initial Tunnel Flow: 209.9 acfm
Average Tunnel Flow: 211.0 scfm
Post-Test Leak Check (1): 0.000 cfm @ 8 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ 6 in. Hg
Average Test Piece Fuel Moisture: 22.67 Dry Basis %

Technician Signature: _____

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.074	0.084	0.080	0.072	0.072	0.080	0.082	0.076	0.086	"H2O
Temp:	79	79	79	79	79	79	79	79	79	°F

V_{straw} 18.84 ft/sec V_{scent} 19.74 ft/sec F_p 0.955

	Particulate Sampling Data													Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst Exit	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
259	42.745	44.996	0.17	0.17	2.31	81	0.18	1.80	79	-3.5	87	0.090	99	98	1.7	0.0	367	272	298	147	241	265	602	201	83	62	85	62	75	-0.018	5.49	0.72
260	42.912	45.171	0.17	0.17	2.32	81	0.19	1.80	79	-3.3	86	0.090	99	99	1.7	0.0	366	272	297	147	241	265	599	200	83	62	84	62	76	-0.018	5.51	0.74
261	43.078	45.345	0.17	0.17	2.32	81	0.41	1.81	79	-3.3	87	0.090	99	98	1.7	0.0	364	271	296	146	240	263	595	199	82	62	85	62	76	-0.018	5.49	0.75
262	43.246	45.520	0.17	0.18	2.32	81	0	1.80	79	-3.3	86	0.090	100	99	1.7	0.0	362	271	295	145	240	263	593	199	82	62	85	62	77	-0.018	5.49	0.76
263	43.413	45.694	0.17	0.17	2.30	81	-0.07	1.79	79	-3.5	86	0.090	99	98	1.7	0.0	361	271	293	145	239	262	589	198	82	62	85	62	77	-0.018	5.46	0.76
264	43.579	45.869	0.17	0.17	2.31	81	-0.06	1.81	79	-3.6	86	0.090	98	99	1.7	0.0	360	270	292	145	238	261	585	196	82	62	85	62	77	-0.018	5.44	0.75
265	43.746	46.044	0.17	0.17	2.32	81	0.04	1.81	80	-3.3	86	0.080	105	105	1.6	-0.1	359	270	292	144	238	261	582	196	83	62	85	62	77	-0.018	5.41	0.74
266	43.913	46.218	0.17	0.17	2.33	81	0.43	1.79	80	-3.6	86	0.080	105	104	1.6	0.0	358	271	291	144	238	260	582	196	83	62	85	63	77	-0.017	5.43	0.76
267	44.080	46.393	0.17	0.17	2.32	81	0.34	1.80	80	-3.6	86	0.090	99	99	1.6	0.0	357	270	290	143	237	259	581	195	83	62	85	63	77	-0.017	5.51	0.81
268	44.248	46.567	0.17	0.17	2.33	81	-0.13	1.81	80	-3.5	86	0.090	100	98	1.6	0.0	358	270	289	142	237	259	578	195	83	62	85	63	76	-0.017	5.52	0.82
269	44.414	46.741	0.17	0.17	2.31	81	0.22	1.80	80	-3.5	86	0.090	98	98	1.6	0.0	357	270	288	142	237	259	577	194	83	62	85	63	76	-0.017	5.55	0.82
270	44.581	46.916	0.17	0.17	2.31	81	-0.07	1.80	80	-3.3	86	0.080	105	105	1.6	0.0	356	270	287	141	237	258	575	193	84	62	85	63	76	-0.016	5.54	0.82
271	44.748	47.091	0.17	0.18	2.32	81	0.28	1.80	80	-3.3	86	0.090	99	99	1.6	0.0	355	270	285	141	236	257	573	192	84	62	85	63	77	-0.017	5.52	0.81
272	44.914	47.266	0.17	0.17	2.32	81	-0.01	1.81	80	-3.5	86	0.090	98	99	1.6	0.0	354	270	284	140	235	257	571	192	84	62	85	63	77	-0.017	5.51	0.84
273	45.082	47.440	0.17	0.17	2.32	81	0.4	1.80	80	-3.5	86	0.090	100	98	1.6	0.0	354	270	283	140	235	256	568	191	83	62	85	63	78	-0.016	5.49	0.85
274	45.249	47.615	0.17	0.18	2.31	81	-0.12	1.81	80	-3.4	86	0.080	105	105	1.6	0.0	353	270	282	140	235	256	565	190	83	62	85	63	77	-0.017	5.46	0.85
275	45.415	47.790	0.17	0.17	2.31	81	0.42	1.81	80	-3.3	85	0.090	98	99	1.6	0.0	352	270	282	140	234	256	562	189	83	62	85	63	77	-0.016	5.43	0.85
276	45.582	47.964	0.17	0.17	2.32	81	-0.13	1.79	80	-3.6	85	0.090	99	98	1.6	0.0	351	270	281	139	234	255	559	189	83	62	85	63	77	-0.016	5.4	0.84
277	45.749	48.139	0.17	0.18	2.32	81	0.1	1.80	80	-3.6	86	0.090	99	99	1.6	0.0	351	270	280	138	234	255	558	188	83	62	85	63	76	-0.016	5.35	0.83
278	45.916	48.313	0.17	0.17	2.33	81	0.21	1.81	80	-3.6	85	0.090	99	98	1.5	0.0	350	270	279	138	233	254	557	188	83	62	85	63	76	-0.016	5.31	0.81
279	46.084	48.488	0.17	0.17	2.31	81	0.41	1.79	80	-3.6	86	0.090	100	99	1.5	0.0	349	270	278	137	233	253	556	187	82	62	85	63	76	-0.015	5.32	0.83
280	46.250	48.663	0.17	0.17	2.30	81	-0.12	1.80	80	-3.4	85	0.090	98	99	1.5	0.0	348	270	277	137	232	253	554	187	82	62	85	63	76	-0.015	5.29	0.81
281	46.417	48.837	0.17	0.17	2.32	81	0.13	1.81	80	-3.6	85	0.090	99	98	1.4	-0.1	346	270	276	137	232	252	551	186	82	62	85	63	76	-0.015	5.29	0.81
282	46.584	49.012	0.17	0.17	2.32	81	0.01	1.80	80	-3.4	85	0.090	99	99	1.4	0.0	345	270	275	136	232	252	548	186	82	62	85	63	76	-0.015	5.26	0.8
283	46.751	49.187	0.17	0.17	2.32	81	0.34	1.80	80	-3.4	85	0.090	99	99	1.4	0.0	344	270	274	136	231	251	546	185	82	62	85	63	76	-0.015	5.26	0.79
284	46.918	49.361	0.17	0.17	2.31	81	0.36	1.81	80	-3.5	85	0.080	105	104	1.4	0.0	343	270	274	136	231	251	543	184	83	62	85	63	76	-0.015	5.25	0.78
285	47.085	49.536	0.17	0.18	2.32	81	0.2	1.80	80	-3.5	85	0.090	99	99	1.4	0.0	342	270	273	136	231	250	541	184	83	62	85	63	76	-0.015	5.22	0.78
286	47.252	49.710	0.17	0.17	2.29	81	0.33	1.79	80	-3.3	85	0.090	99	98	1.4	0.0	342	270	272	135	230	250	536	183	83	62	85	63	76	-0.015	5.22	0.77
287	47.419	49.885	0.17	0.17	2.31	81	0.39	1.80	80	-3.3	85	0.090	99	99	1.4	0.0	341	270	271	135	230	249	534	183	83	62	84	63	75	-0.015	5.18	0.76
288	47.586	50.060	0.17	0.18	2.32	81	0.27	1.81	80	-3.6	85	0.090	99	99	1.4	0.0	340	270	271	134	230	249	531	181	83	63	85	63	76	-0.014	5.17	0.76
289	47.752	50.234	0.17	0.17	2.32	81	0.25	1.80	80	-3.4	85	0.090	98	98	1.4	0.0	339	270	270	134	229	248	530	181	83	63	85	63	75	-0.014	5.15	0.76
290	47.920	50.409	0.17	0.17	2.33	81	-0.06	1.80	80	-3.3	85	0.090	100	99	1.4	0.0	338	269	269	133	229	248	526	181	83	63	85	63	76	-0.014	5.17	0.77
291	48.087	50.584	0.17	0.18	2.29	81	-0.02	1.81	80	-3.3	84	0.090	99	99	1.4	0.0	337	269	268	133	228	247	523	180	83	63	85	63	76	-0.014	5.16	0.76
292	48.253	50.758	0.17	0.17	2.31	81	-0.07	1.80	80	-3.3	85	0.090	98	98	1.4	0.0	336	270	267	133	228	247	521	179	83	63	85	63	76	-0.014	5.14	0.75
293	48.420	50.933	0.17	0.17	2.32	81	0.2	1.80	80	-3.3	84	0.080	105	105	1.4	0.0	335	269	266	133	227	246	518	179	83	63	85	63	76	-0.014	5.11	0.74
294	48.587	51.108	0.17	0.17	2.32	81	0.39	1.81	80	-3.6	84	0.090	99	99	1.4	0.0	334	269	266	133	227	246	514	178	83	63	85	63	77	-0.013	5.11	0.74
295	48.754	51.282	0.17	0.17	2.33	81	0.43	1.80	80	-3.6	84	0.090	99	98	1.4	0.0	333	269	265	133	226	245	511	178	83	63	85	63	76	-0.013	5.09	0.73

OMNI-Test Laboratories, Inc.

Wood Heater Test Data

7

Run: 2

Manufacturer: Hearth & Home
Model: Dauntless NC
Tracking No.: 2389
Project No.: 061WS104E
Test Date: 04-Oct-19
Beginning Clock Time: 13:58

Total Sampling Time: 480 min
Recording Interval: 1 min
Background Sample Volume: _____ cubic feet

Meter Box Y Factor: 0.992 (1) 0.989 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	29.63		29.76	29.70 0

OMNI Equipment Numbers: _____

PM Control Modules: 371, 372
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.284 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 19.19 ft/sec.
Initial Tunnel Flow: 209.9 acfm
Average Tunnel Flow: 211.0 acfm
Post-Test Leak Check (1): 0.000 cfm @ 8 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ 6 in. Hg
Average Test Piece Fuel Moisture: 22.67 Dry Basis %

Technician Signature: _____

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.074	0.084	0.080	0.072	0.072	0.080	0.082	0.076	0.086	"H2O
Temp:	79	79	79	79	79	79	79	79	79	°F

V_{straw} 18.84 ft/sec V_{scent} 19.74 ft/sec F_p 0.955

	Particulate Sampling Data													Fuel Weight (lb)		Temperature Data (°F)													Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst Exit	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
296	48.922	51.457	0.17	0.18	2.32	81	-0.13	1.80	80	-3.4	84	0.090	99	99	1.4	0.0	333	269	264	132	226	245	508	177	82	63	85	63	75	-0.013	5.1	0.73
297	49.088	51.631	0.17	0.17	2.31	81	0.32	1.81	80	-3.3	85	0.090	98	98	1.3	0.0	333	269	264	131	226	245	506	176	82	63	85	63	75	-0.013	5.09	0.73
298	49.255	51.807	0.17	0.18	2.32	81	0.29	1.80	80	-3.4	85	0.090	99	99	1.3	0.0	333	269	263	131	225	244	503	175	82	63	85	63	75	-0.013	5.05	0.72
299	49.422	51.981	0.17	0.17	2.33	81	-0.13	1.80	80	-3.3	85	0.090	99	98	1.3	0.0	332	269	262	130	225	244	500	174	82	63	85	63	76	-0.013	5.05	0.72
300	49.589	52.156	0.17	0.17	2.32	81	-0.08	1.80	80	-3.5	84	0.090	99	99	1.3	0.0	332	269	261	130	224	243	498	174	82	63	85	63	76	-0.013	5.06	0.72
301	49.757	52.330	0.17	0.17	2.33	81	0.08	1.81	80	-3.3	84	0.090	99	98	1.3	0.0	331	269	261	129	224	243	495	174	82	63	85	63	76	-0.012	5.03	0.71
302	49.924	52.505	0.17	0.18	2.33	81	-0.09	1.80	80	-3.3	84	0.090	99	99	1.2	-0.1	330	269	260	130	224	243	492	173	83	63	85	63	76	-0.012	5.03	0.71
303	50.091	52.680	0.17	0.17	2.30	81	0.18	1.81	80	-3.4	84	0.090	99	99	1.2	0.0	329	269	259	129	223	242	491	172	83	63	85	63	76	-0.012	5	0.71
304	50.257	52.854	0.17	0.17	2.32	81	-0.12	1.81	80	-3.3	84	0.080	104	104	1.2	0.0	328	269	258	129	223	241	488	172	83	63	85	64	75	-0.012	4.99	0.71
305	50.424	53.029	0.17	0.18	2.33	81	0.02	1.81	80	-3.3	83	0.090	99	98	1.2	0.0	328	268	258	129	223	241	486	171	83	63	85	64	76	-0.012	4.98	0.7
306	50.592	53.204	0.17	0.17	2.32	81	-0.13	1.80	80	-3.5	84	0.090	99	99	1.2	0.0	328	268	257	128	222	241	484	171	83	63	85	64	76	-0.012	4.95	0.69
307	50.759	53.379	0.17	0.17	2.33	81	-0.09	1.81	80	-3.5	84	0.090	99	99	1.2	0.0	327	268	256	128	222	240	481	171	83	63	85	64	75	-0.012	4.93	0.69
308	50.926	53.553	0.17	0.17	2.32	81	0.26	1.81	80	-3.6	84	0.090	99	98	1.2	0.0	326	268	256	127	221	240	479	170	83	63	85	64	75	-0.012	4.94	0.69
309	51.093	53.728	0.17	0.18	2.30	81	0.43	1.80	80	-3.4	84	0.090	99	99	1.2	0.0	326	268	255	127	221	239	477	169	83	63	85	64	75	-0.011	4.92	0.69
310	51.259	53.903	0.17	0.17	2.31	81	0.42	1.81	80	-3.3	84	0.090	98	99	1.2	0.0	325	268	255	126	220	239	474	168	83	63	85	64	76	-0.011	4.9	0.69
311	51.426	54.078	0.17	0.18	2.32	81	0.42	1.81	80	-3.5	84	0.090	99	99	1.2	0.0	325	267	254	126	219	238	472	168	83	63	85	64	76	-0.011	4.87	0.68
312	51.593	54.252	0.17	0.17	2.33	81	0.21	1.80	80	-3.3	83	0.080	105	104	1.2	0.0	324	267	253	126	219	238	469	167	83	63	85	64	76	-0.011	4.88	0.68
313	51.761	54.427	0.17	0.17	2.32	81	-0.01	1.81	80	-3.4	83	0.090	99	98	1.2	0.0	323	267	252	126	219	237	467	167	83	63	85	64	76	-0.011	4.87	0.68
314	51.928	54.602	0.17	0.17	2.31	81	0.23	1.81	80	-3.3	83	0.090	99	98	1.2	0.0	322	267	252	126	218	237	465	167	82	63	85	64	76	-0.011	4.88	0.68
315	52.094	54.777	0.17	0.18	2.31	81	0.24	1.80	80	-3.4	83	0.090	98	98	1.2	0.0	322	267	251	126	218	237	462	166	82	63	85	64	76	-0.011	4.87	0.67
316	52.261	54.952	0.17	0.17	2.33	81	0.33	1.81	80	-3.4	83	0.090	99	98	1.2	0.0	322	266	251	125	218	236	460	166	82	63	85	64	75	-0.010	4.82	0.67
317	52.429	55.126	0.17	0.17	2.32	81	0.2	1.81	80	-3.4	84	0.080	105	104	1.2	0.0	321	266	250	125	217	236	458	165	82	63	85	64	75	-0.010	4.84	0.67
318	52.596	55.301	0.17	0.18	2.33	81	0.16	1.81	80	-3.4	83	0.090	99	98	1.2	0.0	320	266	250	125	216	235	457	164	82	63	85	64	76	-0.010	4.83	0.66
319	52.763	55.476	0.17	0.17	2.32	81	0.31	1.81	80	-3.6	83	0.090	99	98	1.1	0.0	319	266	249	124	216	235	455	164	82	63	85	64	76	-0.010	4.83	0.66
320	52.930	55.651	0.17	0.18	2.30	81	0.16	1.81	80	-3.4	83	0.090	99	98	1.1	0.0	319	265	248	124	216	234	453	164	83	63	85	64	76	-0.010	4.82	0.66
321	53.096	55.825	0.17	0.17	2.31	81	-0.08	1.81	80	-3.3	83	0.090	98	98	1.1	0.0	318	265	248	124	215	234	451	163	83	63	85	64	76	-0.010	4.82	0.66
322	53.263	56.000	0.17	0.17	2.32	81	-0.1	1.81	80	-3.4	83	0.090	99	98	1.1	0.0	317	265	247	123	215	233	449	163	83	63	85	64	76	-0.010	4.82	0.66
323	53.430	56.175	0.17	0.17	2.32	81	-0.09	1.81	80	-3.6	83	0.090	99	98	1.0	-0.1	317	265	246	124	215	233	447	162	83	63	85	64	76	-0.010	4.79	0.65
324	53.598	56.350	0.17	0.18	2.32	81	-0.12	1.81	80	-3.5	83	0.080	105	104	1.0	0.0	316	264	246	123	214	233	445	162	83	63	85	64	76	-0.010	4.75	0.65
325	53.765	56.525	0.17	0.17	2.32	81	0.33	1.80	80	-3.6	83	0.090	99	98	1.0	0.0	315	264	245	123	214	232	442	161	83	63	85	64	76	-0.010	4.7	0.65
326	53.932	56.699	0.17	0.17	2.31	81	0.04	1.82	80	-3.4	83	0.090	99	98	1.0	0.0	314	264	245	123	214	232	440	161	83	63	84	64	76	-0.010	4.71	0.65
327	54.098	56.875	0.17	0.18	2.31	81	-0.06	1.81	80	-3.3	83	0.090	98	99	1.0	0.0	314	264	244	122	213	231	440	161	83	63	84	64	75	-0.009	4.7	0.65
328	54.265	57.049	0.17	0.17	2.33	81	-0.09	1.81	80	-3.4	83	0.090	99	98	1.0	0.0	313	264	244	122	213	231	437	160	83	64	85	64	76	-0.009	4.68	0.65
329	54.432	57.224	0.17	0.17	2.32	81	0.13	1.82	80	-3.4	83	0.090	99	98	1.0	0.0	313	264	243	122	212	231	436	160	83	64	85	64	76	-0.009	4.68	0.65
330	54.600	57.399	0.17	0.18	2.32	81	-0.13	1.82	80	-3.3	83	0.090	99	98	1.0	0.0	312	263	243	121	212	230	434	159	83	63	84	64	76	-0.009	4.65	0.65
331	54.766	57.574	0.17	0.17	2.31	81	-0.01	1.81	80	-3.4	83	0.090	98	98	1.0	0.0	312	263	242	121	211	230	431	158	83	64	85	64	76	-0.009	4.65	0.65
332	54.933	57.749	0.17	0.18	2.31	81	-0.13	1.79	80	-3.3	83	0.090	99	98	1.0	0.0	312	263	242	121	211	230	429	158	82	64	85	64	76	-0.009	4.64	0.65

OMNI-Test Laboratories, Inc.

Wood Heater Test Data

7

Run: 2

Manufacturer: Hearth & Home
Model: Dauntless NC
Tracking No.: 2389
Project No.: 061WS104E
Test Date: 04-Oct-19
Beginning Clock Time: 13:58

Total Sampling Time: 480 min
Recording Interval: 1 min
Background Sample Volume: _____ cubic feet

Meter Box Y Factor: 0.992 (1) 0.989 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	29.63		29.76	29.70 0

OMNI Equipment Numbers: _____

PM Control Modules: 371, 372
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.284 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 19.19 ft/sec.
Initial Tunnel Flow: 209.9 acfm
Average Tunnel Flow: 211.0 acfm
Post-Test Leak Check (1): 0.000 cfm @ 8 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ 6 in. Hg
Average Test Piece Fuel Moisture: 22.67 Dry Basis %

Technician Signature: _____

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.074	0.084	0.080	0.072	0.072	0.080	0.082	0.076	0.086	"H2O
Temp:	79	79	79	79	79	79	79	79	79	°F

V_{straw} 18.84 ft/sec V_{scent} 19.74 ft/sec F_p 0.955

	Particulate Sampling Data													Fuel Weight (lb)		Temperature Data (°F)											Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst Exit	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
333	55.100	57.923	0.17	0.17	2.32	81	0.13	1.81	80	-3.3	83	0.090	99	98	1.0	0.0	311	262	241	120	210	229	428	157	82	64	85	64	76	-0.009	4.63	0.65
334	55.267	58.098	0.17	0.17	2.33	81	0.41	1.81	80	-3.3	83	0.090	99	98	1.0	0.0	310	262	241	120	210	229	425	157	82	64	85	64	76	-0.009	4.59	0.64
335	55.434	58.273	0.17	0.18	2.33	81	0.08	1.79	80	-3.4	82	0.090	99	98	1.0	0.0	309	262	240	120	209	228	424	156	82	64	85	64	75	-0.009	4.6	0.64
336	55.602	58.448	0.17	0.17	2.31	81	-0.13	1.81	80	-3.4	82	0.090	99	98	1.0	0.0	308	262	239	120	209	228	421	156	82	64	85	64	75	-0.008	4.59	0.64
337	55.769	58.622	0.17	0.17	2.31	81	0.12	1.80	80	-3.4	82	0.080	105	104	1.0	0.0	307	261	239	120	209	227	420	156	82	64	85	64	76	-0.008	4.59	0.64
338	55.935	58.798	0.17	0.18	2.32	81	-0.02	1.81	80	-3.5	82	0.090	98	99	1.0	0.0	307	261	239	119	209	227	419	156	83	64	85	64	75	-0.008	4.56	0.64
339	56.102	58.972	0.17	0.17	2.32	81	0.42	1.82	80	-3.5	82	0.090	99	98	1.0	0.0	306	261	238	119	208	226	417	155	83	64	84	64	75	-0.008	4.54	0.63
340	56.269	59.147	0.17	0.17	2.33	81	0.08	1.81	80	-3.3	83	0.090	99	98	1.0	0.0	305	260	237	119	208	226	414	155	83	64	84	64	75	-0.008	4.53	0.63
341	56.436	59.322	0.17	0.18	2.33	81	0.15	1.81	80	-3.3	83	0.090	99	98	1.0	0.0	305	260	237	118	207	225	414	154	83	64	85	64	75	-0.008	4.54	0.64
342	56.604	59.497	0.17	0.17	2.32	81	0.42	1.82	80	-3.5	82	0.090	99	98	1.0	0.0	305	259	237	118	206	225	412	154	83	64	85	64	76	-0.008	4.53	0.63
343	56.771	59.672	0.17	0.17	2.30	81	0.25	1.81	80	-3.5	82	0.090	99	98	0.9	-0.1	303	259	236	118	206	224	411	153	83	64	85	64	76	-0.008	4.53	0.63
344	56.937	59.847	0.17	0.18	2.31	81	-0.13	1.80	80	-3.5	82	0.090	98	98	0.9	0.0	303	259	235	117	205	224	409	153	83	64	85	64	75	-0.007	4.52	0.63
345	57.104	60.022	0.17	0.17	2.32	81	0	1.82	80	-3.4	82	0.090	99	98	0.9	0.0	302	259	235	117	205	224	406	152	83	64	85	64	76	-0.008	4.51	0.63
346	57.271	60.197	0.17	0.18	2.33	81	0.35	1.81	80	-3.5	82	0.090	99	98	0.9	0.0	301	258	234	117	205	223	405	152	83	64	85	64	76	-0.007	4.49	0.62
347	57.438	60.371	0.17	0.17	2.33	81	0.08	1.80	80	-3.4	82	0.090	99	98	0.9	0.0	300	258	234	117	204	223	403	152	83	64	85	64	76	-0.007	4.45	0.62
348	57.605	60.546	0.17	0.17	2.31	81	0.22	1.82	80	-3.6	82	0.090	99	98	0.9	0.0	299	258	234	117	204	222	403	151	83	64	85	64	76	-0.007	4.43	0.62
349	57.773	60.721	0.17	0.17	2.31	81	0.42	1.81	80	-3.6	82	0.090	99	98	0.8	0.0	299	257	233	117	204	222	404	151	82	64	85	64	76	-0.007	4.41	0.62
350	57.939	60.896	0.17	0.18	2.32	81	-0.11	1.81	80	-3.6	82	0.090	98	98	0.9	0.0	298	257	232	116	203	221	404	151	82	64	85	64	75	-0.007	4.34	0.62
351	58.106	61.071	0.17	0.17	2.32	81	0.42	1.80	80	-3.4	82	0.090	99	98	0.8	0.0	297	256	232	116	203	221	404	150	82	64	85	65	75	-0.007	4.33	0.66
352	58.273	61.246	0.17	0.18	2.33	81	-0.11	1.81	80	-3.5	82	0.090	99	98	0.8	0.0	297	256	231	116	203	221	403	150	82	64	85	65	75	-0.007	4.37	0.68
353	58.441	61.420	0.17	0.17	2.30	81	0.41	1.81	80	-3.5	82	0.090	99	98	0.8	0.0	296	255	231	116	202	220	402	150	82	64	85	65	75	-0.007	4.4	0.69
354	58.608	61.596	0.17	0.18	2.30	81	0.09	1.80	80	-3.6	82	0.080	105	105	0.8	0.0	295	255	230	116	201	219	402	150	82	64	85	65	76	-0.007	4.39	0.68
355	58.775	61.770	0.17	0.17	2.32	81	-0.06	1.81	80	-3.5	82	0.090	99	98	0.8	0.0	294	255	230	115	201	219	401	149	82	64	85	65	76	-0.007	4.38	0.68
356	58.942	61.945	0.17	0.17	2.32	81	-0.11	1.80	80	-3.4	82	0.090	99	98	0.8	0.0	293	254	229	115	201	218	399	149	83	64	85	65	76	-0.007	4.38	0.67
357	59.109	62.120	0.17	0.17	2.33	81	0.39	1.81	80	-3.3	82	0.090	99	98	0.8	0.0	293	254	229	115	200	218	398	149	83	64	85	65	75	-0.007	4.39	0.67
358	59.276	62.295	0.17	0.18	2.33	81	-0.09	1.82	80	-3.5	82	0.080	105	104	0.8	0.0	292	253	228	115	200	218	398	149	83	64	85	65	75	-0.007	4.37	0.67
359	59.443	62.470	0.17	0.17	2.32	81	0.43	1.81	80	-3.6	81	0.090	99	98	0.8	0.0	291	252	228	115	200	217	397	148	83	64	85	65	75	-0.007	4.35	0.66
360	59.610	62.645	0.17	0.18	2.31	81	-0.01	1.81	80	-3.6	81	0.090	99	98	0.8	0.0	290	252	227	115	200	217	397	148	83	64	85	65	75	-0.007	4.36	0.66
361	59.777	62.819	0.17	0.17	2.32	81	0.13	1.81	80	-3.3	82	0.090	99	98	0.8	0.0	289	251	227	114	199	216	395	148	83	64	85	65	75	-0.006	4.34	0.66
362	59.944	62.995	0.17	0.18	2.32	81	-0.02	1.81	80	-3.4	82	0.090	99	99	0.8	0.0	289	251	226	114	198	216	394	148	83	64	85	65	75	-0.006	4.35	0.66
363	60.111	63.169	0.17	0.17	2.33	81	0.42	1.80	80	-3.3	82	0.090	99	98	0.8	0.0	289	250	226	114	198	215	394	147	83	64	85	65	75	-0.006	4.34	0.66
364	60.278	63.344	0.17	0.18	2.33	81	-0.05	1.81	80	-3.6	82	0.080	105	104	0.8	0.0	288	250	226	114	197	215	392	146	83	64	85	65	76	-0.006	4.33	0.66
365	60.445	63.519	0.17	0.17	2.31	81	0.26	1.82	80	-3.4	82	0.090	99	98	0.8	0.0	287	249	225	114	197	214	392	146	83	64	84	65	75	-0.006	4.32	0.66
366	60.612	63.694	0.17	0.18	2.30	81	-0.1	1.80	79	-3.3	82	0.090	99	99	0.8	0.0	287	249	225	113	197	214	391	146	82	64	85	65	75	-0.006	4.32	0.66
367	60.778	63.869	0.17	0.17	2.32	81	-0.08	1.82	80	-3.5	81	0.090	98	98	0.8	0.0	286	248	224	113	196	213	390	146	82	64	85	65	75	-0.006	4.31	0.65
368	60.945	64.044	0.17	0.17	2.32	81	0.42	1.81	79	-3.5	81	0.090	99	98	0.8	0.0	285	248	224	113	196	213	389	146	82	64	85	65	75	-0.006	4.3	0.65
369	61.112	64.218	0.17	0.17	2.33	81	0.41	1.81	79	-3.6	81	0.090	99	98	0.8	0.0	284	247	224	113	196	213	388	146	82	64	85	65	75	0.006	4.3	0.65

OMNI-Test Laboratories, Inc.

Wood Heater Test Data

7

Run: 2

Manufacturer: Hearth & Home
Model: Dauntless NC
Tracking No.: 2389
Project No.: 061WS104E
Test Date: 04-Oct-19
Beginning Clock Time: 13:58

Total Sampling Time: 480 min
Recording Interval: 1 min
Background Sample Volume: _____ cubic feet

Meter Box Y Factor: 0.992 (1) 0.989 (2) _____ (Amb)

Barometric Pressure: Begin 29.63 Middle _____ End 29.76 Average 29.70 0

OMNI Equipment Numbers: _____

PM Control Modules: 371, 372
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.284 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 19.19 ft/sec.
Initial Tunnel Flow: 209.9 acfm
Average Tunnel Flow: 211.0 scfm
Post-Test Leak Check (1): 0.000 cfm @ 8 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ 6 in. Hg
Average Test Piece Fuel Moisture: 22.67 Dry Basis %

Technician Signature: _____

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.074	0.084	0.080	0.072	0.072	0.080	0.082	0.076	0.086	"H2O
Temp:	79	79	79	79	79	79	79	79	79	°F

V_{straw} 18.84 ft/sec V_{scent} 19.74 ft/sec F_p 0.955

	Particulate Sampling Data													Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst Exit	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
370	61.280	64.394	0.17	0.18	2.31	81	0.3	1.81	79	-3.6	81	0.090	99	99	0.7	-0.1	284	247	223	113	196	213	387	145	82	64	85	65	75	-0.006	4.3	0.65
371	61.447	64.568	0.17	0.17	2.33	81	0.4	1.81	80	-3.5	81	0.090	99	98	0.7	0.0	283	246	223	113	195	212	387	145	82	64	85	65	75	-0.006	4.29	0.65
372	61.614	64.743	0.17	0.17	2.32	81	-0.12	1.81	80	-3.5	81	0.090	99	98	0.7	0.0	283	245	223	113	195	212	386	145	82	64	85	65	75	-0.006	4.27	0.64
373	61.781	64.918	0.17	0.18	2.32	81	-0.1	1.81	79	-3.3	81	0.090	99	98	0.7	0.0	283	245	222	113	194	211	385	145	82	64	85	65	75	-0.006	4.25	0.64
374	61.948	65.093	0.17	0.17	2.33	81	0.32	1.82	79	-3.3	81	0.090	99	98	0.7	0.0	282	244	222	112	194	211	384	144	83	64	85	65	75	-0.006	4.24	0.64
375	62.115	65.268	0.17	0.17	2.33	81	-0.12	1.81	80	-3.3	81	0.090	99	98	0.7	0.0	282	244	222	112	193	211	384	144	83	64	85	65	75	-0.006	4.25	0.64
376	62.283	65.443	0.17	0.17	2.33	81	-0.13	1.81	80	-3.5	81	0.090	99	98	0.7	0.0	281	243	221	112	193	210	382	144	83	64	85	65	75	-0.005	4.27	0.64
377	62.449	65.618	0.17	0.17	2.31	81	0.01	1.82	80	-3.3	81	0.090	98	98	0.6	0.0	280	243	221	112	193	210	382	144	83	64	85	65	75	-0.005	4.27	0.64
378	62.616	65.793	0.17	0.18	2.31	81	0.23	1.81	79	-3.5	81	0.090	99	98	0.6	0.0	280	242	221	112	192	209	381	143	83	64	84	65	75	-0.005	4.23	0.64
379	62.783	65.968	0.17	0.17	2.33	81	-0.07	1.81	79	-3.3	81	0.090	99	98	0.6	0.0	280	242	220	112	192	209	381	143	83	64	85	65	75	-0.005	4.21	0.65
380	62.950	66.143	0.17	0.17	2.33	81	0.42	1.81	79	-3.3	81	0.090	99	98	0.6	0.0	279	241	220	112	191	209	381	143	83	65	85	65	75	-0.005	4.21	0.66
381	63.117	66.318	0.17	0.17	2.33	81	0.43	1.82	79	-3.4	81	0.090	99	98	0.6	0.0	278	241	220	112	191	208	380	143	83	65	85	65	75	-0.005	4.23	0.68
382	63.284	66.493	0.17	0.17	2.32	81	0.38	1.80	79	-3.4	81	0.080	105	104	0.6	0.0	278	240	219	112	191	208	379	143	82	64	85	65	75	-0.005	4.21	0.69
383	63.451	66.668	0.17	0.18	2.31	81	0.02	1.82	79	-3.3	81	0.090	99	98	0.6	0.0	278	240	219	111	190	208	378	143	82	65	85	65	75	-0.005	4.17	0.69
384	63.617	66.843	0.17	0.17	2.32	81	0.2	1.81	79	-3.4	81	0.090	98	98	0.6	0.0	278	239	219	111	190	207	378	143	82	65	85	65	75	-0.005	4.2	0.69
385	63.784	67.017	0.17	0.17	2.32	81	0.19	1.80	79	-3.5	81	0.090	99	98	0.6	0.0	277	239	219	111	190	207	377	143	82	65	85	65	75	-0.005	4.18	0.68
386	63.952	67.193	0.17	0.18	2.33	81	-0.1	1.82	79	-3.4	80	0.090	99	99	0.6	0.0	277	238	218	111	189	207	376	142	82	65	85	65	76	-0.005	4.15	0.68
387	64.119	67.368	0.17	0.17	2.32	81	0.32	1.82	79	-3.5	80	0.090	99	98	0.6	0.0	277	238	218	111	189	207	375	142	82	65	85	65	76	-0.005	4.21	0.69
388	64.286	67.542	0.17	0.17	2.33	81	0.42	1.81	79	-3.3	80	0.090	99	98	0.6	0.0	277	237	218	111	188	206	375	142	82	65	85	65	76	-0.005	4.26	0.7
389	64.453	67.718	0.17	0.18	2.32	81	-0.1	1.80	79	-3.5	80	0.080	104	105	0.6	0.0	277	237	218	110	188	206	374	142	82	65	85	65	75	-0.005	4.26	0.69
390	64.619	67.893	0.17	0.17	2.32	81	0.42	1.82	79	-3.4	81	0.090	98	98	0.6	0.0	277	236	218	110	187	206	373	142	83	65	84	65	75	-0.005	4.23	0.69
391	64.786	68.067	0.17	0.17	2.33	81	0.41	1.81	79	-3.3	81	0.090	99	98	0.6	0.0	276	236	217	110	187	205	373	141	83	65	84	65	75	-0.005	4.23	0.69
392	64.953	68.243	0.17	0.18	2.33	81	0.33	1.81	79	-3.6	81	0.090	99	99	0.6	0.0	276	235	217	110	187	205	373	141	83	65	85	65	75	-0.004	4.24	0.69
393	65.122	68.417	0.17	0.17	2.33	81	0.2	1.82	79	-3.3	81	0.090	100	98	0.6	0.0	276	235	217	110	187	205	371	141	83	65	85	65	75	-0.004	4.21	0.68
394	65.288	68.592	0.17	0.17	2.31	81	0.26	1.82	79	-3.3	81	0.090	98	98	0.6	0.0	276	235	217	110	186	205	372	141	83	65	85	65	75	-0.004	4.21	0.69
395	65.455	68.768	0.17	0.18	2.31	81	0.37	1.81	79	-3.3	81	0.080	105	105	0.6	0.0	275	234	217	110	186	204	371	141	83	65	85	65	75	-0.005	4.21	0.68
396	65.621	68.942	0.17	0.17	2.31	81	-0.12	1.82	79	-3.3	81	0.090	98	98	0.6	0.0	275	233	216	110	186	204	369	141	83	65	85	65	75	-0.004	4.21	0.68
397	65.788	69.117	0.17	0.18	2.33	81	-0.04	1.82	79	-3.4	80	0.090	99	98	0.6	0.0	275	233	216	110	185	204	369	140	83	65	85	65	76	-0.004	4.19	0.68
398	65.955	69.292	0.17	0.17	2.33	81	0.43	1.81	79	-3.5	80	0.090	99	98	0.5	-0.1	275	232	216	110	185	204	368	140	83	65	85	65	75	-0.004	4.17	0.69
399	66.123	69.467	0.17	0.17	2.32	81	0.14	1.81	79	-3.3	81	0.090	99	98	0.5	0.0	276	232	216	109	184	203	368	140	83	65	85	65	75	-0.004	4.19	0.72
400	66.290	69.642	0.17	0.17	2.32	81	0.43	1.81	79	-3.5	80	0.090	99	98	0.5	0.0	276	231	216	109	184	203	368	140	82	65	85	65	75	-0.004	4.19	0.72
401	66.456	69.817	0.17	0.17	2.32	81	0.16	1.81	79	-3.4	81	0.090	98	98	0.5	0.0	276	231	216	109	184	203	367	140	82	65	85	65	75	-0.004	4.18	0.72
402	66.623	69.992	0.17	0.18	2.33	81	0.36	1.82	79	-3.6	81	0.090	99	98	0.5	0.0	276	230	216	109	183	203	366	139	82	65	85	65	75	-0.004	4.16	0.71
403	66.790	70.168	0.17	0.18	2.32	81	0.38	1.81	79	-3.3	80	0.090	99	99	0.5	0.0	276	230	215	109	183	203	366	139	82	65	84	65	75	-0.004	4.16	0.71
404	66.958	70.343	0.17	0.17	2.32	81	-0.13	1.81	79	-3.5	80	0.090	99	98	0.5	0.0	276	230	215	109	183	203	365	139	82	65	84	65	75	-0.004	4.15	0.7
405	67.125	70.517	0.17	0.17	2.33	81	0.36	1.82	79	-3.6	80	0.090	99	98	0.5	0.0	275	229	215	109	183	202	364	139	82	65	85	65	75	-0.004	4.14	0.7
406	67.292	70.693	0.17	0.18	2.31	81	-0.13	1.82	79	-3.5	80	0.090	99	99	0.4	0.0	276	228	215	108	182	202	364	139	82	65	85	65	74	0.004	4.13	0.69

Wood Heater Test Data

7

Run: 2

Manufacturer: Hearth & Home
Model: Dauntless NC
Tracking No.: 2389
Project No.: 061WS104E
Test Date: 04-Oct-19
Beginning Clock Time: 13:58

Total Sampling Time: 480 min
Recording Interval: 1 min
Background Sample Volume: _____ cubic feet

Meter Box Y Factor: 0.992 (1) 0.989 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	29.63		29.76	29.70 0

OMNI Equipment Numbers: _____

PM Control Modules: 371, 372
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.284 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 19.19 ft/sec.
Initial Tunnel Flow: 209.9 acfm
Average Tunnel Flow: 211.0 scfm
Post-Test Leak Check (1): 0.000 cfm @ 8 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ 6 in. Hg
Average Test Piece Fuel Moisture: 22.67 Dry Basis %

Technician Signature: _____

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.074	0.084	0.080	0.072	0.072	0.080	0.082	0.076	0.086	"H2O
Temp:	79	79	79	79	79	79	79	79	79	°F

V_{straw} 18.84 ft/sec V_{scent} 19.74 ft/sec F_p 0.955

	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst Exit	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
407	67.458	70.867	0.17	0.17	2.31	81	0.01	1.81	79	-3.4	80	0.090	98	98	0.4	0.0	276	228	215	108	182	202	363	139	83	65	85	66	75	-0.004	4.13	0.69
408	67.625	71.042	0.17	0.17	2.33	81	0.29	1.82	79	-3.6	80	0.090	99	98	0.4	0.0	275	227	215	108	182	201	364	138	83	65	85	66	75	-0.004	4.13	0.68
409	67.792	71.218	0.17	0.18	2.33	81	-0.08	1.82	79	-3.5	80	0.090	99	99	0.4	0.0	275	227	215	108	181	201	363	138	83	65	85	66	75	-0.004	4.1	0.68
410	67.960	71.393	0.17	0.17	2.33	81	0.08	1.81	79	-3.5	80	0.090	99	98	0.4	0.0	275	226	215	108	181	201	362	138	83	65	85	66	75	-0.004	4.1	0.67
411	68.127	71.568	0.17	0.17	2.32	81	-0.06	1.83	79	-3.4	80	0.090	99	98	0.4	0.0	275	226	214	108	181	201	362	138	83	65	85	66	75	-0.004	4.09	0.67
412	68.294	71.743	0.17	0.17	2.31	81	-0.11	1.82	79	-3.6	81	0.080	105	104	0.4	0.0	275	225	214	108	181	201	361	138	83	65	85	66	75	-0.004	4.08	0.67
413	68.460	71.918	0.17	0.18	2.32	81	0.23	1.81	79	-3.4	80	0.090	98	98	0.4	0.0	274	225	214	108	180	200	360	138	83	65	85	66	75	-0.004	4.08	0.67
414	68.627	72.093	0.17	0.17	2.33	81	0.43	1.80	79	-3.5	80	0.090	99	98	0.4	0.0	273	224	214	108	180	200	360	137	83	65	85	66	75	-0.004	4.06	0.66
415	68.794	72.268	0.17	0.17	2.33	81	-0.13	1.82	79	-3.3	80	0.090	99	98	0.4	0.0	273	224	213	108	180	200	361	137	83	65	84	66	76	-0.004	4.03	0.66
416	68.962	72.443	0.17	0.17	2.32	81	0.43	1.80	79	-3.3	80	0.090	99	98	0.4	0.0	272	223	213	108	180	199	363	137	82	65	84	66	76	-0.004	4.03	0.66
417	69.129	72.618	0.17	0.17	2.32	81	0.07	1.81	79	-3.5	80	0.080	104	104	0.4	0.0	272	223	213	107	180	199	365	137	82	65	85	66	75	-0.004	4.05	0.7
418	69.295	72.792	0.17	0.17	2.32	81	0.38	1.82	79	-3.4	80	0.090	98	98	0.4	0.0	271	222	213	107	179	198	364	137	82	65	85	66	75	-0.004	4.14	0.73
419	69.462	72.967	0.17	0.17	2.32	81	0.09	1.81	79	-3.3	80	0.090	99	98	0.4	0.0	270	222	213	107	179	198	366	137	82	65	85	66	75	-0.004	4.17	0.73
420	69.629	73.143	0.17	0.18	2.32	81	-0.13	1.81	79	-3.3	80	0.090	99	99	0.4	0.0	270	221	212	107	178	198	366	137	82	65	85	66	75	-0.004	4.16	0.73
421	69.796	73.317	0.17	0.17	2.31	81	0.33	1.82	79	-3.6	80	0.090	99	98	0.4	0.0	270	221	212	107	178	198	366	137	82	65	85	66	75	-0.004	4.15	0.72
422	69.964	73.492	0.17	0.18	2.32	81	0.16	1.82	79	-3.6	80	0.090	99	98	0.4	0.0	270	221	212	107	178	198	366	137	82	65	85	66	75	-0.004	4.14	0.71
423	70.131	73.668	0.17	0.18	2.30	81	0.2	1.81	79	-3.3	80	0.090	99	99	0.4	0.0	269	220	211	107	178	197	365	137	82	65	85	66	75	-0.004	4.11	0.7
424	70.297	73.842	0.17	0.17	2.32	81	-0.02	1.82	79	-3.4	80	0.090	98	98	0.4	0.0	269	219	211	107	177	197	365	137	83	65	85	66	75	-0.004	4.09	0.69
425	70.464	74.017	0.17	0.17	2.33	81	0.12	1.82	79	-3.5	80	0.090	99	98	0.4	0.0	268	219	211	107	177	196	365	137	83	65	85	66	75	-0.004	4.09	0.69
426	70.631	74.193	0.17	0.18	2.33	81	0.29	1.81	79	-3.5	80	0.090	99	99	0.4	0.0	268	219	210	107	177	196	365	137	83	65	85	66	74	-0.004	4.11	0.69
427	70.799	74.367	0.17	0.17	2.33	81	0.38	1.82	79	-3.3	80	0.090	99	98	0.4	0.0	267	218	210	107	177	196	365	137	83	65	84	66	75	-0.004	4.09	0.69
428	70.965	74.543	0.17	0.18	2.31	81	-0.08	1.81	79	-3.4	80	0.090	98	99	0.3	-0.1	268	218	210	106	177	196	364	137	83	65	84	66	75	-0.004	4.09	0.68
429	71.132	74.717	0.17	0.17	2.31	81	0.43	1.81	79	-3.4	80	0.090	99	98	0.3	0.0	267	217	209	106	177	195	365	137	83	65	85	66	74	-0.004	4.07	0.67
430	71.299	74.892	0.17	0.17	2.32	81	-0.06	1.82	79	-3.3	80	0.090	99	98	0.3	0.0	267	217	209	106	176	195	365	136	83	65	85	66	74	-0.004	4.08	0.67
431	71.466	75.068	0.17	0.18	2.33	81	0	1.82	79	-3.4	80	0.090	99	99	0.3	0.0	266	217	209	106	176	195	366	136	83	65	85	66	74	-0.003	4.07	0.66
432	71.632	75.243	0.17	0.17	2.34	81	0.42	1.80	79	-3.5	80	0.090	98	98	0.3	0.0	267	216	208	106	175	194	365	136	82	65	85	66	75	-0.004	4.06	0.66
433	71.800	75.417	0.17	0.17	2.32	81	0.16	1.82	79	-3.3	80	0.090	99	98	0.3	0.0	266	216	208	106	175	194	365	136	82	65	85	66	75	-0.004	4.05	0.66
434	71.967	75.593	0.17	0.18	2.32	81	-0.12	1.82	79	-3.4	80	0.080	104	105	0.3	0.0	266	216	208	106	175	194	365	136	82	65	85	66	75	-0.004	4.07	0.66
435	72.133	75.768	0.17	0.17	2.33	81	0.4	1.81	79	-3.5	80	0.090	98	98	0.2	0.0	266	215	208	106	175	194	363	136	82	65	85	66	75	-0.004	4.03	0.65
436	72.300	75.943	0.17	0.17	2.33	80	0.12	1.83	79	-3.3	80	0.090	99	98	0.2	0.0	265	215	207	106	175	194	363	136	82	65	85	66	74	-0.004	4.07	0.66
437	72.467	76.118	0.17	0.17	2.32	80	0.39	1.82	79	-3.4	80	0.090	99	98	0.2	0.0	265	214	207	106	175	193	362	136	82	66	85	66	74	-0.004	4.04	0.65
438	72.634	76.292	0.17	0.17	2.32	81	-0.13	1.82	79	-3.4	80	0.090	99	98	0.2	0.0	264	214	206	106	175	193	362	136	82	66	85	66	74	-0.004	4.08	0.65
439	72.802	76.468	0.17	0.18	2.32	80	0.42	1.80	79	-3.3	80	0.090	99	99	0.2	0.0	264	214	206	106	175	193	362	135	82	66	84	66	74	-0.004	4.05	0.65
440	72.969	76.642	0.17	0.17	2.31	80	0.06	1.82	79	-3.6	80	0.090	99	98	0.2	0.0	264	213	206	105	174	192	361	136	82	65	84	66	74	-0.003	4.01	0.64
441	73.135	76.817	0.17	0.17	2.32	80	-0.05	1.81	79	-3.5	80	0.090	98	98	0.2	0.0	263	213	205	105	174	192	362	135	83	66	84	66	74	-0.003	4.03	0.64
442	73.302	76.993	0.17	0.18	2.32	80	0.07	1.80	79	-3.3	80	0.090	99	99	0.2	0.0	264	213	205	105	173	192	361	135	83	66	85	66	75	-0.003	4.03	0.64
443	73.469	77.167	0.17	0.17	2.33	80	0.4	1.82	79	-3.3	80	0.090	99	98	0.2	0.0	263	213	205	105	173	192	360	135	83	66	85	66	75	-0.003	4.01	0.64

Wood Heater Test Data

7

Run: 2

Manufacturer: Hearth & Home
Model: Dauntless NC
Tracking No.: 2389
Project No.: 061WS104E
Test Date: 04-Oct-19
Beginning Clock Time: 13:58

Total Sampling Time: 480 min
Recording Interval: 1 min
Background Sample Volume: _____ cubic feet

Meter Box Y Factor: 0.992 (1) 0.989 (2) _____ (Amb)

Barometric Pressure: Begin 29.63 Middle _____ End 29.76 Average 29.70 0

OMNI Equipment Numbers: _____

PM Control Modules: 371, 372
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.284 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 19.19 ft/sec.
Initial Tunnel Flow: 209.9 acfm
Average Tunnel Flow: 211.0 acfm
Post-Test Leak Check (1): 0.000 cfm @ 8 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ 6 in. Hg
Average Test Piece Fuel Moisture: 22.67 Dry Basis %

Technician Signature: _____

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.074	0.084	0.080	0.072	0.072	0.080	0.082	0.076	0.086	"H2O
Temp:	79	79	79	79	79	79	79	79	79	°F

V_{straw} 18.84 ft/sec V_{scent} 19.74 ft/sec F_p 0.955

	Particulate Sampling Data													Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst Exit	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
444	73.636	77.342	0.17	0.17	2.31	80	0.05	1.81	79	-3.3	80	0.090	99	98	0.2	0.0	263	212	205	105	173	192	360	135	83	66	85	66	75	-0.003	3.98	0.64
445	73.803	77.518	0.17	0.18	2.30	80	0	1.82	79	-3.3	80	0.090	99	99	0.2	0.0	262	212	204	105	173	191	360	135	83	66	85	66	75	-0.003	3.95	0.63
446	73.970	77.692	0.17	0.17	2.32	80	0.32	1.82	79	-3.3	80	0.090	99	98	0.2	0.0	262	212	204	105	173	191	359	135	83	66	85	66	74	-0.003	3.96	0.64
447	74.137	77.867	0.17	0.18	2.32	80	0.17	1.82	79	-3.6	80	0.090	99	98	0.2	0.0	262	212	204	105	173	191	359	135	83	66	85	66	74	-0.003	3.95	0.64
448	74.304	78.042	0.17	0.17	2.33	80	0.24	1.81	79	-3.5	80	0.090	99	98	0.2	0.0	261	211	203	105	173	191	358	135	82	66	85	66	74	-0.003	3.95	0.63
449	74.470	78.217	0.17	0.17	2.33	80	0.17	1.82	79	-3.5	79	0.080	104	104	0.2	0.0	261	211	203	105	172	190	358	135	82	66	85	66	75	-0.003	3.96	0.63
450	74.638	78.392	0.17	0.17	2.33	80	-0.11	1.82	79	-3.3	79	0.090	99	98	0.1	-0.1	261	211	202	105	172	190	358	135	82	66	85	66	74	-0.003	3.95	0.63
451	74.804	78.567	0.17	0.17	2.30	80	0.35	1.81	79	-3.3	79	0.090	98	98	0.1	0.0	261	210	202	105	172	190	358	135	82	66	84	66	74	-0.003	3.96	0.63
452	74.971	78.742	0.17	0.18	2.32	80	-0.13	1.82	79	-3.5	80	0.090	99	98	0.1	0.0	260	210	202	105	172	190	357	134	82	66	84	66	74	-0.003	3.95	0.63
453	75.138	78.917	0.17	0.17	2.33	80	0.41	1.81	79	-3.4	79	0.090	99	98	0.1	0.0	261	210	202	104	171	190	357	134	82	66	84	66	75	-0.003	3.93	0.63
454	75.305	79.092	0.17	0.17	2.33	80	0.34	1.81	79	-3.5	79	0.090	99	98	0.1	0.0	260	210	201	104	171	189	357	134	82	66	85	66	74	-0.003	3.93	0.63
455	75.473	79.267	0.17	0.17	2.33	80	0.05	1.82	79	-3.4	79	0.090	99	98	0.1	0.0	260	210	201	104	171	189	356	134	82	66	85	66	75	-0.003	3.93	0.63
456	75.639	79.442	0.17	0.17	2.32	80	0.42	1.81	79	-3.4	79	0.090	98	98	0.1	0.0	259	209	200	105	171	189	355	134	82	66	85	66	75	-0.003	3.93	0.63
457	75.806	79.617	0.17	0.18	2.31	80	-0.1	1.81	79	-3.5	79	0.090	99	98	0.1	0.0	259	209	200	104	171	189	354	134	83	66	85	66	74	-0.003	3.91	0.63
458	75.973	79.792	0.17	0.17	2.32	80	0.25	1.82	79	-3.6	79	0.080	105	104	0.1	0.0	258	209	200	104	171	188	354	134	83	66	85	66	74	-0.003	3.89	0.63
459	76.140	79.968	0.17	0.18	2.33	80	0.07	1.82	79	-3.4	79	0.090	99	99	0.1	0.0	258	209	200	104	171	188	354	134	83	66	85	66	74	-0.003	3.88	0.62
460	76.306	80.142	0.17	0.17	2.33	80	0.33	1.80	79	-3.3	79	0.090	98	98	0.1	0.0	258	209	199	104	171	188	353	134	83	66	85	66	74	-0.003	3.87	0.62
461	76.474	80.317	0.17	0.17	2.32	80	-0.07	1.83	79	-3.3	79	0.090	99	98	0.1	0.0	257	208	199	104	170	188	353	134	83	66	85	66	74	-0.003	3.86	0.62
462	76.640	80.492	0.17	0.18	2.31	80	0.43	1.82	79	-3.3	79	0.090	98	98	0.1	0.0	257	208	199	104	170	188	353	134	83	66	85	66	74	-0.003	3.84	0.62
463	76.807	80.667	0.17	0.17	2.32	80	0.19	1.81	79	-3.6	79	0.090	99	98	0.1	0.0	257	208	198	104	170	187	352	133	83	66	84	66	74	-0.003	3.82	0.61
464	76.973	80.842	0.17	0.17	2.32	80	-0.09	1.81	79	-3.4	79	0.080	104	104	0.1	0.0	258	208	198	104	170	188	352	133	82	66	84	66	75	-0.003	3.84	0.62
465	77.141	81.017	0.17	0.17	2.33	80	0.13	1.82	79	-3.3	79	0.090	99	98	0.1	0.0	259	208	198	104	170	188	352	133	82	66	84	66	75	-0.003	3.95	0.64
466	77.308	81.192	0.17	0.17	2.32	80	-0.06	1.82	79	-3.5	79	0.090	99	98	0.1	0.0	259	208	198	104	169	188	351	133	82	66	85	66	75	-0.003	3.95	0.64
467	77.475	81.367	0.17	0.18	2.32	80	-0.13	1.80	79	-3.5	79	0.080	105	104	0.1	0.0	259	208	198	104	170	188	350	133	82	66	85	66	74	-0.003	3.94	0.62
468	77.641	81.542	0.17	0.17	2.31	80	0.42	1.82	79	-3.4	79	0.090	98	98	0.1	0.0	259	208	197	104	169	187	349	132	82	66	85	66	74	-0.003	3.89	0.61
469	77.808	81.717	0.17	0.17	2.33	80	0.34	1.81	79	-3.5	79	0.090	99	98	0.1	0.0	259	207	197	104	169	187	348	133	82	66	85	66	74	-0.003	3.85	0.6
470	77.975	81.892	0.17	0.17	2.32	80	0.06	1.82	79	-3.3	79	0.090	99	98	0.1	0.0	259	207	197	104	169	187	347	132	82	66	85	66	74	-0.003	3.83	0.59
471	78.142	82.067	0.17	0.17	2.34	80	-0.11	1.82	79	-3.3	79	0.090	99	98	0.1	0.0	259	207	197	104	169	187	348	132	82	66	85	66	74	-0.003	3.79	0.58
472	78.309	82.242	0.17	0.18	2.31	80	0.29	1.82	79	-3.6	79	0.090	99	98	0.1	0.0	258	207	197	104	169	187	348	132	82	66	85	66	74	-0.003	3.76	0.57
473	78.476	82.417	0.17	0.17	2.31	80	0.13	1.82	79	-3.5	79	0.090	99	98	0.0	0.0	258	207	196	104	168	187	347	132	83	66	85	66	74	-0.002	3.75	0.57
474	78.642	82.592	0.17	0.17	2.32	80	-0.06	1.82	79	-3.3	79	0.090	98	98	0.0	0.0	258	207	196	104	168	187	346	132	83	66	85	66	74	-0.003	3.75	0.57
475	78.809	82.767	0.17	0.17	2.32	80	-0.04	1.83	79	-3.6	79	0.090	99	98	0.0	0.0	258	206	196	104	168	186	345	132	83	66	84	66	74	-0.003	3.7	0.57
476	78.976	82.942	0.17	0.17	2.32	80	0.28	1.82	79	-3.3	79	0.090	99	98	0.0	0.0	258	206	196	104	168	186	344	132	83	66	84	66	74	-0.003	3.71	0.57
477	79.143	83.117	0.17	0.18	2.30	80	-0.13	1.83	79	-3.3	79	0.090	99	98	0.0	0.0	257	206	195	104	168	186	344	132	83	66	84	66	74	-0.003	3.68	0.56
478	79.310	83.292	0.17	0.17	2.32	80	0.43	1.81	79	-3.3	79	0.090	99	98	0.0	0.0	257	206	195	103	167	186	343	132	83	66	85	66	74	-0.002	3.68	0.56
479	79.476	83.468	0.17	0.18	2.30	80	0.4	1.82	79	-3.5	79	0.090	98	99	0.0	0.0	256	206	195	103	167	185	342	132	83	66	85	66	74	-0.003	3.65	0.56
480	79.643	83.642	0.17	0.17	2.32	80	-0.09	1.82	79	-3.4	79	0.090	99	98	0.0	0.0	256	205	195	103	167	185	341	131	82	66	85	66	74	0.002	3.63	0.56

Wood Heater Test Data

7

Run: 2

Manufacturer: Hearth & Home
Model: Dauntless NC
Tracking No.: 2389
Project No.: 061WS104E
Test Date: 04-Oct-19
Beginning Clock Time: 13:58

Total Sampling Time: 480 min
Recording Interval: 1 min
Background Sample Volume: ____ cubic feet

Meter Box Y Factor: 0.992 (1) 0.989 (2) ____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	29.63		29.76	29.70 0

OMNI Equipment Numbers: ____

PM Control Modules: 371, 372
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.284 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 19.19 ft/sec.
Initial Tunnel Flow: 209.9 acfm
Average Tunnel Flow: 211.0 scfm
Post-Test Leak Check (1): 0.000 cfm @ 8 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ 6 in. Hg
Average Test Piece Fuel Moisture: 22.67 Dry Basis %

Technician Signature: ____

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.074	0.084	0.080	0.072	0.072	0.080	0.082	0.076	0.086	"H2O
Temp:	79	79	79	79	79	79	79	79	79	°F

V_{straw} 18.84 ft/sec V_{scent} 19.74 ft/sec F_p 0.955

	Particulate Sampling Data													Fuel Weight (lb)		Temperature Data (°F)														Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst Exit	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
Avg/Tot	79.643	83.642	0.17	0.17	2.28	82		1.79	80		90	0.088	100	100								184.6				61	85	61	76	-0.025		

Wood Heater Lab Data

Manufacturer:	Hearth & Home	Equipment Numbers:	
Model:	Dauntless NC		
Tracking No.:	2389		
Project No.:	061WS104E		
Run #:	2		
Date:	10/4/19		

TRAIN 1 (First Hour emissions)

Sample Component	Reagent	Filter, Probe or Dish #	Weights		
			Final, mg	Tare, mg	Particulate, mg
B. Front filter catch	Filter	T211S	90.8	90.6	0.2
C. Rear filter catch	Filter				0.0
D. Probe catch*	Probe				0.0
E. Filter seals catch*	Seals				0.0

Sub-Total | Total Particulate, mg: | 0.2

TRAIN 1 (Post First Hour Change-out)

Sample Component	Reagent	Filter, Probe or Dish #	Weights		
			Final, mg	Tare, mg	Particulate, mg
B. Front filter catch	Filter	T204AP	183.3	181.6	1.7
C. Rear filter catch	Filter				0.0
D. Probe catch*	Probe	62	117660.9	117660.9	0.0
E. Filter seals catch*	Seals	R889	3295.1	3295.1	0.0

Sub-Total | Total Particulate, mg: | 1.7

Train 1 Aggregate | Total Particulate, mg: | **1.9**

TRAIN 2

Sample Component	Reagent	Filter, Probe or Dish #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Front filter catch	Filter	T204BP	185.6	183.4	2.2
B. Rear filter catch	Filter				0.0
C. Probe catch*	Probe	66	118155.0	118455.0	0.0
D. Filter seals catch*	Seals	R890	3368.9	3368.8	0.1

Total Particulate, mg: **2.3**

AMBIENT

Sample Component	Reagent	Filter # or Probe #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Front filter catch*	Filter				0.0

Total Particulate, mg: **0.0**

*Particulate catch that results in a negative number, is assumed to be zero for probes and seals, negative numbers for filters are assumed to be part of the seal weight.

Component	Equations:
A. Front filter catch	Final (mg) - Tare (mg) = Particulate, mg
B. Rear filter catch	Final (mg) - Tare (mg) = Particulate, mg
C. Probe catch	Final (mg) - Tare (mg) = Particulate, mg

Technician Signature: 

OMNI-Test Laboratories, Inc.

Wood Heater Test Results

Manufacturer: Hearth & Home
Model: Dauntless NC
Project No.: 061WS104E
Tracking No.: 2389
Run: 2
Test Date: 10/04/19

Burn Rate	**0.95 kg/hr dry**
Average Tunnel Temperature	90 degrees Fahrenheit
Average Gas Velocity in Dilution Tunnel - vs	19.19 feet/second
Average Gas Flow Rate in Dilution Tunnel - Qsd	12658.0 dscf/hour
Average Delta p	0.088 inches H20
Total Time of Test	480 minutes

	AMBIENT	SAMPLE TRAIN 1	SAMPLE TRAIN 2	FIRST HOUR FILTER (TRAIN 1)
Total Sample Volume - Vm	0.000 cubic feet	79.643 cubic feet	83.642 cubic feet	9.850 cubic feet
Average Gas Meter Temperature	76 degrees Fahrenheit	82 degrees Fahrenheit	80 degrees Fahrenheit	83 degrees Fahrenheit
Total Sample Volume (Standard Conditions) - Vmstd	0.000 dscf	76.850 dscf	80.597 dscf	9.476 dscf
Total Particulates - m_n	0 mg	1.9 mg	2.3 mg	0.2 mg
Particulate Concentration (dry-standard) - C_r/C_s	0.000000 grams/dscf	0.00002 grams/dscf	0.00003 grams/dscf	0.00002 grams/dscf
Total Particulate Emissions - E_T	0.00 grams	2.50 grams	2.89 grams	0.27 grams
Particulate Emission Rate	0.00 grams/hour	0.31 grams/hour	0.36 grams/hour	0.27 grams/hour
Emissions Factor		0.33 g/kg	0.38 g/kg	0.11 g/kg
Difference from Average Total Particulate Emissions		0.19 grams	0.19 grams	
		Dual Train Comparison Results Are Acceptable		

FINAL AVERAGE RESULTS

Complete Test Run	
Total Particulate Emissions - E_T	2.70 grams
Particulate Emission Rate	**0.34 grams/hour**
Emissions Factor	0.36 grams/kg
First Hour Emissions	
Total Particulate Emissions - E_T	0.27 grams
Particulate Emission Rate	0.27 grams/hour
Emissions Factor	0.11 grams/kg
7.5% of Average Total Particulate Emissions	0.20 grams

QUALITY CHECKS

Filter Temps < 90 °F	OK
Filter Face Velocity (47 mm)	OK
Dryer Exit Temp < 80F	OK
Leakage Rate	OK
Ambient Temp (55-90°F)	OK
Negative Probe Weight Eval.	OK
Pro-Rate Variation	OK
Train A - Train B G/KG ≤ 0.5	0.05
Total PM Precision (%)	7.16

Technician Signature: 

Wood Heater Efficiency Results - CSA B415.1

Manufacturer: Hearth & Home
Model: Dauntless NC
Date: 10/04/19
Run: 2
Control #: 061WS104E
Test Duration: 480
Output Category: II

Technician Signature: 

Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
Overall Efficiency	76.5%	82.0%
Combustion Efficiency	94.4%	94.4%
Heat Transfer Efficiency	81%	86.8%

Output Rate (kJ/h)	13,634	12,933	**(Btu/h)**
Burn Rate (kg/h)	0.95	2.09	**(lb/h)**
Input (kJ/h)	17,819	16,903	**(Btu/h)**

Test Load Weight (dry kg)	7.58	16.71	**dry lb**
MC wet (%)	18.47826087		
MC dry (%)	22.67		
Particulate (g)	0.34		
CO (g)	578		
Test Duration (h)	8.00		

Emissions	Particulate	CO
g/MJ Output	0.00	5.30
g/kg Dry Fuel	0.04	76.20
g/h	0.04	72.23
lb/MM Btu Output	0.01	12.31

Air/Fuel Ratio (A/F)	12.63

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

Adjunct to ASTM E XXXX Wood Heater Cordwood Test Method - May 10, 2017 Version
Cordwood Fuel Load Calculators - 12 lb/ft^3 Nominal Load Density
Core 45-65% of Total Load Weight, Remainder 35-55% of Total Load Weight
Values to be input manually

For Usable Firebox Volumes up to 3.0 ft^3 - Low and Medium Fire

Nominal Required Load Density (wet basis)	12	lb/ft^3				
Usable Firebox Volume	1.82	ft^3				
Total Nom. Load Wt. Target	21.84	lb				
Total Load Wt. Allowable Range	20.75	to	22.93	lb		
Core Target Wt. Allowable Range	9.828	to	14.20	lb		
Remainder Load Wt. Allowable Range	7.64	to	12.01	lb		
						Mid-Point
Core Load Fuel Pc. Wt. Allowable Range	3.28	to	5.46	lb		4.37
Remainder Load Pc. Wt. Allowable Range	2.18	to	6.55	lb		4.37
	Pc. #					
Core Load Piece Wt. Actual	1	3.28	lb	In Range		
	2	4.80	lb	In Range		
	3	4.60	lb	In Range		
Core Load Total. Wt. Actual		12.68	lb	In Range		
	Pc. #					
Remainder Load Piece Wt.	1	5.40	lb	In Range		
(2 or 3 Pcs.)	2	2.74	lb	In Range		
	3		lb	NA		
Remainder Load Piece Weight Ratio - Small/Large		51%		In Range		≤ 67%
Remainder Load Tot. Wt. Act		8.14	lb	In Range		
Total Load Wt. Actual		20.82	lb	In Range		
Core % of Total Wt.		61%		In Range		45-65%
Remainder % of Total Wt.		39%		In Range		35-55%
Actual Load % of Nominal Target		95%		In Range		95-105%
Actual Fuel Load Density		11.4	lb/ft^3			
Allowable Charcoal Bed Wt. Range (lb)	2.1	to	4.1			Mid-Point
Actual Charcoal Bed Wt.		3.0	lb	In Range		3.1
Actual Fuel Load Ending Wt.		0.3	lb	Valid Test		≥ 90%
Total Wt. of Fuel Burned During Test Run lb.		20.5	lb			

Fuel Piece Moisture Reading (%-dry basis)

1	2	3	Ave.		Pc. Wt. Dry Basis			
23.8	23	23.6	23.5	In Range	2.66	lb	1.21	kg
26	26.2	25.2	25.8	In Range	3.82	lb	1.73	kg
19.2	18.6	19.8	19.2	In Range	3.86	lb	1.75	kg
18.2	19.8	20.2	19.4	In Range	4.52	lb	2.05	kg
27	25.2	24.2	25.5	In Range	2.18	lb	0.99	kg
			NA	NA	NA	lb	NA	kg
Total Load Ave. MC % (dry basis)			22.2	In Range				
Total Load Ave. MC % (wet basis)			18.2					
Total Test Load Weight (dry basis) →					17.04	lb	7.73	kg
Total Fuel Weight Burned During Test Run (dry basis)					16.7	lb	7.59	kg

OMNI-Test Laboratories, Inc.

Wood Heater Run Sheets

Client: Hearth & Home Project Number: 0061WS104E Run Number: 2
Model: Dauntless-Flexburn Tracking Number: 2389 Date: 10/4/19
Test Crew: C. Davis
OMNI Equipment ID numbers:

Wood Heater Run Notes

Air Control Settings

Primary:

Full closed

Secondary: fixed

Tertiary/Pilot: N/A

Fan: On Low

Preburn Notes

Time	Notes
N/A	

Test Notes

Sketch test fuel configuration:

See photo

Start up procedures & Timeline:

Bypass: open for 55 seconds then closed
Fuel loaded by: 50 seconds
Door closed at: 55 seconds
Primary air: AT test setting entire test

Notes: Fan on Low entire test

Time	Notes
60	changed front filter in train A.

Technician Signature: [signature] Date: 11/11/19

OMNI-Test Laboratories, Inc.

Wood Heater Run Sheets

Client: Hearth & Home Project Number: 0061WS104E Run Number: 2
Model: Dauntless-Flexburn NC Tracking Number: 2389 Date: 10/4/19
Test Crew: B Davis
OMNI Equipment ID numbers:

Wood Heater Supplemental Data

Start Time: 1358 Booth #:
Stop Time:

Stack Gas Leak Check:
Initial: Final: good

Sample Train Leak Check:
A: 0.0 @ 8 "Hg
B: 0.0 @ 6 "Hg

Calibrations: Span Gas CO_2: 15.0 CO: 2.0

	Pre Test		Post Test	
	Zero	Span	Zero	Span
Time	see Run 1		2210	2210
CO_2			0.02	15.07
CO			0.00	1.992

Air Velocity (ft/min): Initial: 250 Final: 250
Scale Audit (lbs): Initial: 10.0 Final: 10.0
Pitot Tube Leak Test: Initial: good Final: good
Stack Diameter (in): 6"
Induced Draft: 0.0
% Smoke Capture: 100 %
Flue Pipe Cleaned Prior to First Test in Series:
Date: 9/30/19 Initials: BC

	Initial	Middle	Ending
P_b (in/Hg)	29.63		29.76
RH (%)	44		41
Ambient (°F)	81		74

Tunnel Traverse

Microtector Reading	dP (in H_2O)	T(°F)
	.074	79
	.084	79
	.080	79
	.072	79
	.072	79
	.080	79
	.082	79
	.076	79
Center:		
	.086	79

Tunnel Static Pressure (in H_2O):	
Beginning of Test	End of Test
-.284	-.284

Background Filter Volume: N/A

Technician Signature: BD Date: 11/1/19

Run 3

Non-Sampling High Burn 1-minute data

Results (Cold to Hot Cycle)

Wood Heater Test Data

7

Run: 3

Manufacturer: Hearth & Home
Model: Dauntless NC
Tracking No.: 2389
Project No.: 061WS104E
Test Date: 05-Oct-19
Beginning Clock Time: 09:17

Total Sampling Time: 156 min
Recording Interval: 1 min
Background Sample Volume: ____ cubic feet

Meter Box Y Factor: 0.992 (1) 0.989 (2) ____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	29.90		29.87	29.89 0

OMNI Equipment Numbers: ____

PM Control Modules: 371, 372
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: ____ "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: #DIV/0! ft/sec.
Initial Tunnel Flow: #DIV/0! scfm
Average Tunnel Flow: #DIV/0! scfm
Post-Test Leak Check (1): ____ cfm @ ____ in. Hg
Post-Test Leak Check (2): ____ cfm @ ____ in. Hg
Average Test Piece Fuel Moisture: 22.00 Dry Basis %

Technician Signature: ____

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP										"H2O
Temp:										°F

V_{straw} ____ ft/sec V_{scent} ____ ft/sec F_p ____

	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)													Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst Exit	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
0															3.5		72	71	71	72	72	72		72					71	0.018	0.1	0
1															3.4	-0.07	74	71	71	72	71	72		149					71	-0.019	0.08	0
2															3.5	0.11	83	72	72	73	72	74		205					71	-0.019	0.32	0.01
3															3.2	-0.31	107	73	74	75	72	80		293					71	0.033	1.22	0.03
4															3.2	-0.09	125	75	77	76	72	85		317					71	-0.036	3.6	0.06
5															3.1	-0.04	142	77	80	77	72	90		309					71	-0.033	4.88	0.1
6															3.0	-0.15	165	79	83	78	72	95		374					71	-0.049	4.93	0.12
7															2.8	-0.15	197	83	89	80	72	104		445					71	-0.054	5.46	0.17
8															2.6	-0.15	231	89	96	83	72	114		456					71	-0.052	7.18	0.19
9															2.6	-0.09	264	96	103	86	72	124		474					71	-0.056	8.31	0.23
10															2.4	-0.15	294	103	110	88	72	133		488					71	-0.056	8.39	0.26
11															2.3	-0.11	318	109	116	90	72	141		461					72	-0.053	8.61	0.21
12															2.2	-0.13	332	114	120	92	73	146		466					72	-0.055	7.89	0.15
13															2.1	-0.11	344	118	124	94	74	151		478					72	-0.054	7.24	0.15
14															1.9	-0.11	354	122	129	96	75	155		454					72	-0.052	7.61	0.15
15															1.8	-0.13	366	127	133	98	76	160		458					72	-0.055	7.19	0.23
16															1.7	-0.11	382	132	139	100	78	166		466					72	-0.053	7.15	0.27
17															1.6	-0.09	389	138	144	102	81	171		439					72	-0.049	7.71	0.26
18															1.5	-0.11	393	142	148	103	83	174		424					72	-0.049	7.23	0.3
19															1.5	-0.04	393	147	152	103	86	176		418					72	-0.051	6.54	0.31
20															6.7	5.20	382	150	155	104	89	176		297					72	-0.035	6.1	0.32
21															6.5	-0.15	369	153	156	106	92	175		303					72	-0.038	3.77	0.25
22															6.3	-0.15	365	155	158	108	95	176		288					72	-0.030	7.18	1.01
23															6.2	-0.15	365	159	162	110	99	179		260					72	-0.028	8.99	1.3
24															6.0	-0.15	367	163	165	110	102	181		246					72	-0.026	8.25	1.86
25															5.9	-0.13	368	167	169	111	105	184		237					72	-0.025	8.18	2
26															5.8	-0.11	367	171	172	111	107	186		230					72	-0.024	8.2	1.98
27															5.6	-0.15	365	175	174	111	110	187		224					72	-0.023	7.53	1.59
28															5.6	-0.09	364	179	176	111	113	189		221					72	-0.023	7.08	1.36
29															5.4	-0.11	364	183	178	111	116	190		220					73	-0.022	7.04	1.3
30															5.4	-0.09	361	187	179	111	118	191		218					73	-0.022	7.23	1.41
31															5.2	-0.11	359	191	181	110	121	192		216					73	-0.021	7.18	1.44
32															5.1	-0.15	355	196	182	110	123	193		259					73	-0.033	6.85	1.22
33															4.9	-0.15	355	200	183	113	126	195		292					73	-0.038	6.27	1.05
34															4.8	-0.13	354	205	184	118	129	198		326					73	-0.041	8.59	1.54
35															4.7	-0.15	354	210	186	123	132	201		344					73	-0.042	10.86	1.54
36															4.5	-0.11	356	214	187	128	134	204		351					73	-0.042	11.65	1.07

OMNI-Test Laboratories, Inc.

Wood Heater Test Data

7

Run: 3

Manufacturer: Hearth & Home
Model: Dauntless NC
Tracking No.: 2389
Project No.: 061WS104E
Test Date: 05-Oct-19
Beginning Clock Time: 09:17

Total Sampling Time: 156 min
Recording Interval: 1 min
Background Sample Volume: ____ cubic feet

Meter Box Y Factor: 0.992 (1) 0.989 (2) ____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	29.90		29.87	29.89 0

OMNI Equipment Numbers: ____

PM Control Modules: 371, 372
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: ____ "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: #DIV/0! ft/sec.
Initial Tunnel Flow: #DIV/0! scfm
Average Tunnel Flow: #DIV/0! scfm
Post-Test Leak Check (1): ____ cfm @ ____ in. Hg
Post-Test Leak Check (2): ____ cfm @ ____ in. Hg
Average Test Piece Fuel Moisture: 22.00 Dry Basis %

Technician Signature: ____

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP										"H2O
Temp:										°F

V_{straw} ____ ft/sec V_{scent} ____ ft/sec F_p ____

	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst Exit	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
37															4.4	-0.13	357	219	188	133	137	207		362					73	-0.044	11.63	0.6
38															4.3	-0.11	357	223	189	138	139	209		374					73	-0.046	11.71	0.44
39															4.1	-0.15	358	227	190	143	141	212		384					73	-0.047	11.86	0.55
40															4.0	-0.15	359	230	191	148	144	214		392					73	-0.048	12.22	0.72
41															3.9	-0.13	360	234	193	154	146	217		411					73	-0.051	12.3	0.65
42															3.7	-0.11	360	237	193	161	148	220		428					73	-0.052	12.67	0.91
43															3.6	-0.15	359	240	194	168	151	222		435					73	-0.052	13.09	1.13
44															3.4	-0.15	359	242	194	172	154	224		435					73	-0.052	13.11	0.86
45															3.4	-0.09	359	244	195	177	156	226		431					73	-0.051	13.01	0.51
46															3.3	-0.04	359	246	195	181	159	228		428					73	-0.051	12.83	0.38
47															3.1	-0.20	360	248	196	185	163	230		425					73	-0.051	12.23	0.33
48															3.0	-0.11	361	250	197	187	166	232		426					74	-0.050	12.04	0.3
49															2.9	-0.09	361	252	198	190	170	234		427					74	-0.051	11.77	0.28
50															2.8	-0.11	362	254	199	192	173	236		427					74	-0.050	11.79	0.21
51															2.7	-0.11	364	256	200	195	177	238		427					73	-0.051	11.93	0.13
52															2.6	-0.09	366	258	201	197	181	241		427					74	-0.051	11.99	0.09
53															2.7	0.10	368	260	202	197	186	243		425					74	-0.050	12.21	0.08
54															18.0	15.30	363	262	203	202	189	244		331					74	-0.051	12.15	0.05
55															17.5	-0.55	352	262	202	205	195	243		415					74	-0.054	8.77	0.11
56															17.3	-0.20	343	263	201	209	200	243		443					74	-0.056	10.22	0.29
57															17.1	-0.20	334	263	200	212	205	243		457					74	-0.058	13.94	0.56
58															16.9	-0.15	327	262	200	216	209	243		473					74	-0.058	15.42	1.99
59															16.7	-0.20	321	262	199	221	213	243		481					74	-0.059	15.64	1.99
60															16.5	-0.15	316	261	198	226	217	244		487					74	-0.059	15.7	1.31
61															16.3	-0.20	311	260	198	229	221	244		493					74	-0.060	15.6	1.18
62															16.1	-0.20	309	260	197	234	225	245		493					74	-0.059	15.65	1.36
63															16.0	-0.15	306	259	197	239	229	246		495					74	-0.060	15.78	1.44
64															15.8	-0.20	304	258	197	243	233	247		499					74	-0.060	15.65	1.13
65															15.6	-0.15	304	257	196	245	237	248		502					75	-0.061	15.65	1.11
66															15.4	-0.20	302	257	196	250	241	249		504					74	-0.061	15.76	0.99
67															15.3	-0.15	301	257	196	253	246	251		505					75	-0.061	15.77	0.82
68															15.1	-0.20	300	256	196	256	251	252		507					75	-0.062	15.58	0.75
69															14.9	-0.20	299	256	196	258	255	253		509					74	-0.062	15.81	0.69
70															14.7	-0.15	299	256	197	259	260	254		511					74	-0.062	16.37	0.69
71															14.5	-0.20	299	256	197	261	265	258		512					74	-0.062	16.49	0.52
72															14.3	-0.20	299	257	198	262	269	257		512					74	-0.062	16.6	0.45
73															14.2	-0.15	300	257	199	266	274	259		512					74	-0.062	16.69	0.25

OMNI-Test Laboratories, Inc.

Wood Heater Test Data

7

Run: 3

Manufacturer: Hearth & Home
Model: Dauntless NC
Tracking No.: 2389
Project No.: 061WS104E
Test Date: 05-Oct-19
Beginning Clock Time: 09:17

Total Sampling Time: 156 min
Recording Interval: 1 min
Background Sample Volume: _____ cubic feet

Meter Box Y Factor: 0.992 (1) 0.989 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	29.90		29.87	29.89 0

OMNI Equipment Numbers: _____

PM Control Modules: 371, 372
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: _____ "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: #DIV/0! ft/sec.
Initial Tunnel Flow: #DIV/0! scfm
Average Tunnel Flow: #DIV/0! scfm
Post-Test Leak Check (1): _____ cfm @ _____ in. Hg
Post-Test Leak Check (2): _____ cfm @ _____ in. Hg
Average Test Piece Fuel Moisture: 22.00 Dry Basis %

Technician Signature: _____

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP										"H2O
Temp:										°F

V_{straw} _____ ft/sec V_{scent} _____ ft/sec F_p _____

	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)													Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst Exit	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
74															14.0	-0.20	302	258	199	268	279	261		515					74	-0.062	16.65	0.14
75															13.9	-0.13	304	259	200	271	283	263		512					74	-0.062	16.52	0.09
76															13.7	-0.15	307	261	201	272	287	266		511					74	-0.062	16.06	0.04
77															13.5	-0.20	311	262	202	274	292	268		511					75	-0.061	15.6	0.02
78															13.3	-0.15	313	264	204	275	296	270		504					75	-0.061	15.77	0.02
79															13.2	-0.20	316	266	205	275	301	273		505					75	-0.061	15.22	0.01
80															13.0	-0.15	319	269	206	275	304	275		505					76	-0.061	15.02	0.01
81															12.8	-0.15	325	272	209	275	308	278		504					75	-0.061	15.39	0.01
82															12.7	-0.15	330	275	210	275	312	280		499					75	-0.061	15.35	0.01
83															12.5	-0.20	332	278	212	273	314	282		496					75	-0.061	14.38	0.02
84															12.4	-0.13	334	282	214	274	317	284		498					76	-0.061	13.83	0.02
85															12.2	-0.15	337	285	215	273	320	286		498					76	-0.061	14	0.01
86															12.0	-0.15	339	288	217	273	322	288		499					75	-0.061	14.29	0.01
87															11.9	-0.15	342	291	219	273	327	290		502					75	-0.060	14.34	0.01
88															11.7	-0.20	344	295	220	273	330	292		503					75	-0.061	14.56	0.01
89															11.5	-0.15	347	297	222	273	333	294		504					75	-0.062	14.76	0.01
90															11.4	-0.15	350	301	224	274	335	297		504					75	-0.061	14.78	0.01
91															11.2	-0.20	353	304	225	275	337	299		503					76	-0.061	14.9	0.01
92															11.1	-0.13	357	308	227	276	339	301		504					77	-0.061	14.9	0.01
93															10.9	-0.15	360	311	229	276	341	303		504					76	-0.062	14.86	0.01
94															10.7	-0.20	365	314	230	278	343	306		506					77	-0.062	14.95	0.01
95															10.5	-0.15	370	318	232	278	345	309		503					77	-0.061	15.21	0.02
96															10.4	-0.15	375	322	234	278	346	311		502					77	-0.061	14.98	0.02
97															10.2	-0.15	378	325	236	279	346	313		505					77	-0.061	14.58	0.02
98															10.0	-0.20	383	329	238	279	347	315		502					76	-0.061	14.76	0.03
99															9.9	-0.15	388	332	240	280	349	318		501					77	-0.061	15.07	0.02
100															9.8	-0.13	392	335	242	280	348	319		502					77	-0.061	15	0.01
101															9.6	-0.15	397	337	244	281	350	322		503					77	-0.061	15.01	0.01
102															9.4	-0.20	407	341	246	281	351	325		503					77	-0.061	15	0.01
103															9.2	-0.15	420	344	249	281	353	329		502					76	-0.061	15.07	0.01
104															9.1	-0.20	433	347	252	281	354	333		510					76	-0.061	15.04	0.01
105															8.9	-0.11	449	352	256	282	354	339		512					76	-0.062	15.38	0.02
106															8.7	-0.20	462	355	260	284	356	343		514					76	-0.062	15.91	0.03
107															8.5	-0.20	475	358	263	284	356	347		514					77	-0.061	15.69	0.05
108															8.4	-0.15	485	362	267	284	355	351		511					77	-0.061	15.65	0.09
109															8.3	-0.13	491	366	270	285	356	354		509					77	-0.061	15.39	0.12
110															8.1	-0.15	497	369	274	284	356	356		508					78	-0.061	15.03	0.1

OMNI-Test Laboratories, Inc.

Wood Heater Test Data

7

Run: 3

Manufacturer: Hearth & Home
Model: Dauntless NC
Tracking No.: 2389
Project No.: 061WS104E
Test Date: 05-Oct-19
Beginning Clock Time: 09:17

Total Sampling Time: 156 min
Recording Interval: 1 min
Background Sample Volume: ____ cubic feet

Meter Box Y Factor: 0.992 (1) 0.989 (2) ____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	29.90		29.87	29.89 0

OMNI Equipment Numbers: ____

PM Control Modules: 371, 372
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: ____ "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: #DIV/0! ft/sec.
Initial Tunnel Flow: #DIV/0! scfm
Average Tunnel Flow: #DIV/0! scfm
Post-Test Leak Check (1): ____ cfm @ ____ in. Hg
Post-Test Leak Check (2): ____ cfm @ ____ in. Hg
Average Test Piece Fuel Moisture: 22.00 Dry Basis %

Technician Signature:

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP										"H2O
Temp:										°F

V_{stav} ____ ft/sec V_{scent} ____ ft/sec F_p ____

	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)													Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst Exit	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
111															7.9	-0.15	501	373	276	284	356	358		505					77	-0.061	14.92	0.06
112															7.7	-0.20	504	376	280	283	357	360		504					78	-0.061	15.07	0.03
113															7.6	-0.15	513	379	282	283	357	363		505					78	-0.061	14.97	0.02
114															7.4	-0.15	525	382	286	284	357	367		505					78	-0.061	14.87	0.06
115															7.3	-0.13	522	385	291	284	356	368		506					78	-0.061	15.23	0.09
116															7.2	-0.15	518	387	296	283	356	368		503					78	-0.060	15.77	0.04
117															7.0	-0.15	515	388	301	283	357	369		503					78	-0.061	15.65	0.02
118															6.8	-0.15	512	389	305	284	357	369		505					78	-0.061	15.51	0.02
119															6.7	-0.15	509	390	307	284	358	370		504					78	-0.060	15.67	0.02
120															6.6	-0.13	510	391	308	284	359	370		503					78	-0.060	15.32	0.01
121															6.4	-0.15	513	392	310	285	360	372		502					78	-0.061	15.06	0.01
122															6.3	-0.15	517	394	311	284	360	373		501					78	-0.060	14.9	0.01
123															6.1	-0.15	522	396	313	284	360	375		500					78	-0.059	14.79	0.02
124															5.9	-0.15	527	399	315	283	363	377		501					77	-0.060	14.76	0.02
125															5.8	-0.15	532	402	317	283	363	379		502					77	-0.060	14.7	0.03
126															5.7	-0.13	537	404	318	282	364	381		500					77	-0.059	14.72	0.03
127															5.5	-0.11	542	406	320	281	365	383		499					77	-0.059	14.68	0.03
128															5.5	-0.09	549	409	322	282	365	385		497					79	-0.060	14.61	0.03
129															5.3	-0.20	561	411	324	282	364	388		495					79	-0.060	14.6	0.03
130															5.1	-0.15	573	415	328	282	364	392		504					79	-0.061	14.56	0.07
131															4.9	-0.20	583	417	332	283	364	396		511					79	-0.061	15.35	0.18
132															4.8	-0.15	594	420	338	284	364	400		522					79	-0.062	16.31	0.48
133															4.6	-0.20	606	422	345	286	363	404		529					79	-0.063	16.76	0.57
134															4.4	-0.20	615	424	354	288	363	409		528					79	-0.062	16.97	0.76
135															4.2	-0.15	622	425	361	289	361	412		525					79	-0.062	17.08	0.54
136															4.2	-0.04	625	426	368	291	360	414		519					80	-0.061	16.99	0.32
137															3.9	-0.26	630	427	375	292	359	417		512					81	-0.060	16.82	0.19
138															3.8	-0.09	632	427	381	291	358	418		505					81	-0.060	16.36	0.08
139															3.6	-0.15	635	427	387	290	357	419		500					81	-0.059	15.82	0.04
140															3.5	-0.15	637	427	393	288	355	420		495					82	-0.059	15.52	0.04
141															3.3	-0.15	637	427	398	285	354	420		489					81	-0.058	15.23	0.03
142															3.3	-0.09	636	426	403	283	353	420		484					81	-0.058	15.02	0.02
143															3.1	-0.15	633	426	409	280	352	420		481					81	-0.057	14.75	0.01
144															3.0	-0.09	630	425	413	276	350	419		476					82	-0.057	14.38	0.01
145															2.9	-0.11	627	424	418	273	348	418		471					82	-0.056	14.05	0.01
146															2.8	-0.11	623	423	422	270	346	417		468					81	-0.056	13.76	0.02
147															2.7	-0.09	619	422	426	267	344	416		465					81	-0.056	13.51	0.02

Wood Heater Test Data

7

Run: 3

Manufacturer: Hearth & Home
Model: Dauntless NC
Tracking No.: 2389
Project No.: 061WS104E
Test Date: 05-Oct-19
Beginning Clock Time: 09:17

Total Sampling Time: 156 min
Recording Interval: 1 min
Background Sample Volume: ____ cubic feet

Meter Box Y Factor: 0.992 (1) 0.989 (2) ____ (Amb)

Barometric Pressure: Begin 29.90 Middle ____ End 29.87 Average 29.89 0

OMNI Equipment Numbers: ____

PM Control Modules: 371, 372
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: ____ "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: #DIV/0! ft/sec.
Initial Tunnel Flow: #DIV/0! acfm
Average Tunnel Flow: #DIV/0! scfm
Post-Test Leak Check (1): ____ cfm @ ____ in. Hg
Post-Test Leak Check (2): ____ cfm @ ____ in. Hg
Average Test Piece Fuel Moisture: 22.00 Dry Basis %

Technician Signature: 

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP										"H2O
Temp:										°F

V_{straw} ____ ft/sec V_{scent} ____ ft/sec F_p ____

	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst Exit	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
148															2.6	-0.11	616	420	430	265	343	415		464					82	-0.056	13.25	0.02
149															2.5	-0.09	613	419	433	262	342	414		461					82	-0.055	13.06	0.02
150															2.4	-0.11	609	418	435	260	341	413		458					82	-0.054	12.95	0.02
151															2.3	-0.09	606	416	438	258	340	412		455					81	-0.054	12.73	0.02
152															2.2	-0.11	604	415	440	256	338	411		455					82	-0.055	12.57	0.02
153															2.1	-0.09	602	414	441	254	338	410		453					82	-0.053	12.69	0.02
154															2.0	-0.11	602	413	442	253	337	409		451					82	-0.055	12.84	0.02
155															1.9	-0.09	604	413	444	252	336	410		449					82	-0.054	12.7	0.03
156															1.8	-0.11	604	412	445	250	335	409		447					82	-0.053	12.41	0.05
Avg/Tot	0.000	0.000	0.00	#DIV/0!	#DIV/0!	#DIV/0!		#DIV/0!	#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!								337.6				#DIV/0!	#DIV/0!	#DIV/0!	76	-0.053		

Wood Heater Test Results

Manufacturer: Hearth & Home
Model: Dauntless NC
Project No.: 061WS104E
Tracking No.: 2389
Run: 3
Test Date: 10/05/19

Burn Rate	**3.44 kg/hr dry**
Average Tunnel Temperature	
Average Gas Velocity in Dilution Tunnel - vs	
Average Gas Flow Rate in Dilution Tunnel - Qsd	
Average Delta p	
Total Time of Test	102 minutes

AMBIENT	SAMPLE TRAIN 1	SAMPLE TRAIN 2	FIRST HOUR FILTER (TRAIN 1)
	#DIV/0!		

FINAL AVERAGE RESULTS

QUALITY CHECKS

Filter Temps < 90 °F	OK
Filter Face Velocity (47 mm)	OK
Dryer Exit Temp < 80F	OK
Ambient Temp (55-90°F)	OK

Technician Signature: _____

Adjunct to ASTM E XXXX Wood Heater Cordwood Test Method - May 10, 2017 Version
Cordwood Fuel Load Calculators - 10 lb/ft^3 Nominal Load Density
Core 45-65% of Total Load Weight, Remainder 35-55% of Total Load Weight
Values to be input manually

For All Usable Firebox Volumes - High Fire Test Only

Nominal Required Load Density (wet basis)	10	lb/ft^3				
Usable Firebox Volume	1.82	ft^3				
Total Nom. Load Wt. Target	18.20	lb				
Total Load Wt. Allowable Range	17.30	to	19.10	lb		
Core Target Wt. Allowable Range	8.20	to	11.80	lb		
Remainder Load Wt. Allowable Range	6.40	to	10.00	lb		
						Mid-Point
Core Load Pc. Wt. Allowable Range	2.70	to	4.60	lb		3.65
Remainder Load Pc. Wt. Allowable Range	1.80	to	10.00	lb		5.90
	Pc. #					
Core Load Piece Wt. Actual	1	2.81	lb	In Range		
	2	3.90	lb	In Range		
	3	3.65	lb	In Range		
Core Load Total. Wt. Actual		10.36	lb	In Range		
	Pc. #					
Remainder Load Piece Wt.	1	4.24	lb	In Range		
(1 to 3 Pcs.)	2	3.38	lb	In Range		
	3		lb	NA		
Remainder Load Tot. Wt. Act		7.62	lb	In Range		
Total Load Wt. Actual		17.98	lb	In Range		
Core % of Total Wt.		58%		In Range	45-65%	
Remainder % of Total Wt.		42%		In Range	35-55%	
Actual Load % of Nominal Target		99%		In Range	95-105%	
Actual Fuel Load Density		9.9	lb/ft^3			
Kindling and Start-up Fuel						
Maximim Kindling Wt. (20% of Tot. Load Wt.)		3.60	lb			
Actual Kindling Wt.		3.46	lb	In Range	19.2%	
Maximum Start-up Fuel Wt. (30% of Tot. Load Wt.)		5.39	lb			
Actual Start-up Fuel Wt.		5.37	lb	In Range	29.9%	
Allowable Residual Start-up Fuel Wt. Range	1.8	to	3.6	lb		Mid-Point
Actual Residual Start-up Fuel Wt.		2.7	lb	In Range		2.7
Total Wt. All Fuel Added (wet basis)		26.81	lb			
High Fire Test Run End Point Range	Low		High			Mid-Point
Based on Fuel Load Wt. (w/tares)	1.6	to	2.0	lb		1.8
Actual Fuel Load Ending Wt.		1.8	lb	In Range		

Fuel Piece Moisture Reading (%-dry basis)

1	2	3	Ave.		Pc. Wt. Dry Basis		
23	22.2	22.5	22.6	In Range	2.29 lb	1.04 kg	
22.8	21	23	22.3	In Range	3.19 lb	1.45 kg	
22.2	19.8	20.5	20.8	In Range	3.02 lb	1.37 kg	
21.5	24.5	19.5	21.8	In Range	3.48 lb	1.58 kg	
23.2	21.5	22.8	22.5	In Range	2.76 lb	1.25 kg	
			NA	NA	NA lb	NA kg	
Total Load Ave. MC (%-dry basis)			22.0	In Range			
Total Load Ave. MC % (wet basis)			18.0				
Total Test Load Weight (dry basis) →					14.74 lb	6.69 kg	
Kindling Moisture (%-dry basis)							
10	10	10	10.0	In Range	3.15 lb	1.43 kg	
Start-up Fuel Moisture Readings (%-dry basis)							
20.9	20.9	20.9	20.9	In Range	4.44 lb	2.01 kg	
Total Wt. All Fuel Added (dry basis) →					22.33 lb	10.13 kg	
Total Wt. All Fuel Burned (dry basis) →					17.8 lb	8.1 kg	

OMNI-Test Laboratories, Inc.

Wood Heater Run Sheets

Client: Hearth & Home | Project Number: 0061WS104E | Run Number: 3
Model: Dauntless-Flexburn NC | Tracking Number: 2389 | Date: 10/5/19
Test Crew: BDavis
OMNI Equipment ID numbers:

Wood Heater Run Notes

Air Control Settings

Primary: Non Sampling High fully open

Secondary: fixed

Tertiary/Pilot: N/A

Fan: On High

Preburn Notes

Time	Notes
0	Torch used for 30 seconds, Bypass open, door open, Air fully open Door closed at 2.0 minutes
19.5	loaded Start up fuel. Bypass closed, door closed, Air fully open, fan on high by 20 min.
32	~~Reload~~ Relocated fuel pieces
53	At 53 min 2.55 lbs loaded test load. Bypass and door were opened then closed by 54 minutes.

Test Notes

Sketch test fuel configuration: See photo

Start up procedures & Timeline:

Bypass:
Fuel loaded by:
Door closed at:
Primary air:

Notes: Fan on high entire test

Time	Notes
N/A	

Technician Signature: BDavis Date: 11/11/19

OMNI-Test Laboratories, Inc.

Wood Heater Run Sheets

Client: Hearth & Home Project Number: 0061WS104E Run Number: 3
Model: Dauntless-Flexburn NC Tracking Number: 2389 Date: 10/5/19
Test Crew: A. DAVIS
OMNI Equipment ID numbers:

Wood Heater Supplemental Data

Start Time: 0917 Booth #:
Stop Time:

Stack Gas Leak Check:
Initial: good Final:

Sample Train Leak Check:
A: N/A @ "Hg
B: @ "Hg

Calibrations: Span Gas CO_2: 15% CO: 2%

	Pre Test		Post Test	
	Zero	Span	Zero	Span
Time	0908	0908	See Run 4	
CO_2	0.00	15.03		
CO	0.00	2.00		

Air Velocity (ft/min): Initial: 450 Final: 450
Scale Audit (lbs): Initial: 10.0 Final: 10.0
Pitot Tube Leak Test: Initial: good Final: good
Stack Diameter (in): 6"
Induced Draft: 0.0
% Smoke Capture: 100 %
Flue Pipe Cleaned Prior to First Test in Series:
Date: 9/30/19 Initials: BC

	Initial	Middle	Ending
P_b (in/Hg)	29.90		29.87
RH (%)	32		29
Ambient (°F)	71		82

Tunnel Traverse

Microtector Reading	dP (in H_2O)	T(°F)
N/A		
Center:		

Tunnel Static Pressure (in H_2O):	
Beginning of Test	End of Test
N/A	

Background Filter Volume: N/A

Technician Signature: Date: 11/11/19

Run 4

Low Burn

Wood Heater Test Data

7

Run: 4

Manufacturer: Hearth & Home
Model: Dauntless NC
Tracking No.: 2389
Project No.: 061WS104E
Test Date: 05-Oct-19
Beginning Clock Time: 12:41

Total Sampling Time: 586 min
Recording Interval: 1 min
Background Sample Volume: ____ cubic feet

Meter Box Y Factor: 0.992 (1) 0.989 (2) ____ (Amb)

Barometric Pressure:

Begin	Middle	End	Average
29.87		29.78	29.83

0

OMNI Equipment Numbers: ____

PM Control Modules: 371, 372
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.282 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 18.88 ft/sec.
Initial Tunnel Flow: 213.4 scfm
Average Tunnel Flow: 209.2 scfm
Post-Test Leak Check (1): 0.000 cfm @ 6 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ 10 in. Hg
Average Test Piece Fuel Moisture: 22.83 Dry Basis %

Technician Signature:

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.074	0.082	0.084	0.080	0.074	0.084	0.084	0.076	0.084	"H2O
Temp:	79	79	79	79	79	79	79	79	79	°F

V_{straw} 18.98 ft/sec V_{scent} 19.43 ft/sec F_p 0.977

	Particulate Sampling Data													Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst Exit	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
0	0.000	0.000			0.04	82	0.25	0.65	81	1.2	99	0.080			21.6		474	369	387	185	332	349	798	267	83	65	85	57	81	-0.029	6.96	0.41
1	0.127	0.174	0.13	0.17	2.18	83	0.06	1.73	81	-3	129	0.080	80	105	21.4	-0.2	463	367	385	184	332	346	820	249	84	47	85	46	81	-0.037	6.87	0.5
2	0.290	0.345	0.16	0.17	2.26	83	0.23	1.77	81	-3.3	102	0.080	101	100	21.4	0.0	440	365	381	183	332	340	979	258	84	45	85	45	81	-0.036	4.47	0.37
3	0.454	0.517	0.16	0.17	2.23	83	0.54	1.75	81	-3.1	101	0.080	101	101	21.3	-0.1	423	361	376	182	332	335	1077	270	84	45	85	45	81	-0.037	5.08	0.55
4	0.616	0.689	0.16	0.17	2.20	83	0.21	1.74	81	-3.2	100	0.080	100	101	21.2	-0.1	406	358	370	184	332	330	1172	282	84	45	85	45	81	-0.039	8.33	0.48
5	0.777	0.859	0.16	0.17	2.14	83	0.19	1.80	81	-3.2	100	0.080	99	100	21.1	-0.1	392	354	365	185	332	326	1257	291	84	45	86	45	80	-0.040	9.56	0.4
6	0.945	1.033	0.17	0.17	2.31	83	-0.02	1.79	81	-3.3	100	0.090	98	96	21.0	-0.1	380	349	360	187	332	322	1268	297	84	45	86	45	81	-0.040	10.56	0.31
7	1.111	1.206	0.17	0.17	2.28	83	0.31	1.79	81	-3.1	99	0.080	102	101	20.9	-0.1	368	345	355	190	331	318	1309	295	84	45	86	45	80	-0.040	10.82	0.34
8	1.276	1.380	0.17	0.17	2.29	83	0.51	1.78	81	-3.1	99	0.080	102	102	20.8	-0.1	358	341	350	192	330	314	1307	294	84	45	86	45	80	-0.039	11.2	0.17
9	1.441	1.552	0.17	0.17	2.28	83	0.17	1.77	81	-3.3	99	0.080	102	101	20.7	-0.1	348	336	346	193	329	310	1267	288	84	45	86	45	80	-0.038	10.8	0.26
10	1.606	1.725	0.17	0.17	2.27	83	0.52	1.76	81	-3.3	98	0.080	102	101	20.7	0.0	339	332	341	195	329	307	1282	285	84	45	86	45	80	-0.038	10.31	0.31
11	1.770	1.897	0.16	0.17	2.24	83	0.53	1.75	81	-3.3	98	0.080	101	101	20.6	0.0	331	327	337	196	328	304	1262	279	84	45	86	45	80	-0.037	9.88	0.4
12	1.934	2.068	0.16	0.17	2.25	83	0.44	1.76	81	-3.1	97	0.080	101	100	20.5	-0.1	323	323	332	197	326	300	1206	272	84	45	86	46	80	-0.037	9.63	0.42
13	2.098	2.240	0.16	0.17	2.25	83	0.17	1.76	81	-3.3	97	0.090	95	95	20.5	0.0	317	319	328	197	325	297	1137	266	84	45	86	46	80	-0.035	9.07	0.52
14	2.262	2.412	0.16	0.17	2.23	83	0.49	1.75	81	-3.3	97	0.080	101	100	20.4	0.0	310	315	324	197	324	294	1068	261	84	46	86	46	80	-0.035	8.11	0.78
15	2.425	2.583	0.16	0.17	2.22	83	0.42	1.74	81	-3	96	0.080	100	100	20.4	0.0	304	311	320	198	323	291	1080	257	84	46	85	46	79	-0.035	7.53	1.07
16	2.588	2.755	0.16	0.17	2.24	83	0.49	1.74	81	-3.3	96	0.080	100	100	20.3	-0.1	298	307	316	195	321	287	1150	255	83	46	85	46	79	-0.034	7.11	1.23
17	2.752	2.926	0.16	0.17	2.26	83	0.26	1.77	81	-3.3	96	0.080	101	100	20.3	-0.1	293	303	313	194	320	285	1053	252	83	46	85	46	79	-0.033	7.34	1.15
18	2.916	3.098	0.16	0.17	2.26	83	0.17	1.76	81	-3.3	96	0.090	95	95	20.2	-0.1	288	299	309	193	318	281	928	246	83	46	85	46	79	-0.032	7.46	1.04
19	3.080	3.271	0.16	0.17	2.26	83	-0.02	1.75	81	-3.2	96	0.080	101	101	20.1	0.0	284	296	306	192	317	279	914	240	83	46	85	46	79	-0.032	6.58	1.35
20	3.245	3.443	0.17	0.17	2.25	83	0.23	1.80	81	-3.4	95	0.080	101	100	20.1	0.0	279	292	302	190	315	276	925	238	83	46	85	46	79	-0.032	5.95	1.44
21	3.408	3.618	0.16	0.18	2.23	83	0.13	1.80	81	-3.2	95	0.080	100	102	20.0	-0.1	275	289	300	188	313	273	899	236	84	46	85	46	79	-0.031	6.01	1.44
22	3.571	3.792	0.16	0.17	2.24	83	0.46	1.81	81	-3.4	95	0.080	100	101	19.9	0.0	272	285	297	186	312	270	895	234	84	46	85	46	79	-0.031	6.08	1.44
23	3.736	3.966	0.17	0.17	2.23	83	0.48	1.80	81	-3.4	95	0.080	101	101	19.9	0.0	268	282	294	184	310	268	884	232	84	46	85	46	79	-0.031	6.18	1.44
24	3.899	4.141	0.16	0.18	2.24	83	0.03	1.79	81	-3.4	94	0.080	100	102	19.8	-0.1	264	279	291	183	309	265	873	231	84	46	85	46	78	-0.030	6.15	1.44
25	4.063	4.314	0.16	0.17	2.25	83	0.24	1.80	81	-3.4	94	0.080	101	101	19.7	0.0	261	276	289	181	306	263	851	229	84	46	85	46	78	-0.030	6.08	1.43
26	4.226	4.489	0.16	0.18	2.24	83	-0.06	1.79	81	-3.2	94	0.080	100	102	19.7	0.0	258	273	285	179	305	260	849	228	84	47	86	46	78	-0.029	6	1.44
27	4.390	4.662	0.16	0.17	2.21	83	0.5	1.79	81	-3.2	94	0.080	101	101	19.6	-0.1	255	271	283	178	304	258	850	227	84	47	86	46	79	-0.029	5.97	1.43
28	4.553	4.836	0.16	0.17	2.22	83	0.44	1.78	81	-3.4	94	0.090	94	96	19.5	0.0	252	268	281	176	303	256	896	228	84	47	86	46	79	-0.030	6.08	1.45
29	4.716	5.009	0.16	0.17	2.22	83	-0.06	1.79	81	-3.2	94	0.080	100	101	19.4	-0.1	250	265	278	175	302	254	992	231	84	47	86	46	78	-0.031	6.31	1.46
30	4.879	5.183	0.16	0.17	2.20	83	0.23	1.78	81	-3.1	94	0.080	100	101	19.4	0.0	247	263	276	174	300	252	1067	235	84	47	86	46	78	-0.032	6.89	1.4
31	5.040	5.356	0.16	0.17	2.20	83	0.44	1.77	81	-3.1	94	0.080	99	101	19.3	-0.1	244	260	274	174	299	250	1131	240	84	47	86	46	78	-0.032	7.42	1.3
32	5.205	5.529	0.17	0.17	2.29	83	0.43	1.76	81	-3.2	94	0.080	101	101	19.2	-0.1	243	258	272	173	297	249	1186	245	84	47	85	46	78	-0.033	7.87	1.21
33	5.370	5.702	0.17	0.17	2.27	83	0.36	1.78	81	-3.4	95	0.090	96	95	19.1	0.0	240	255	270	174	296	247	1196	251	83	47	85	46	78	-0.034	8.3	1.19
34	5.535	5.875	0.17	0.17	2.26	83	0.38	1.78	81	-3.1	95	0.080	101	101	19.0	-0.1	238	253	269	175	294	246	1265	260	83	48	85	47	78	-0.036	8.82	1.15
35	5.699	6.048	0.16	0.17	2.26	83	0.39	1.77	81	-3.3	95	0.080	101	101	19.0	-0.1	236	251	267	176	293	245	1273	270	83	48	85	47	78	-0.037	9.49	1.07
36	5.865	6.221	0.17	0.17	2.26	83	0.4	1.77	81	-3.4	95	0.080	102	101	18.8	-0.1	235	249	265	178	291	244	1309	282	83	48	85	47	78	-0.039	10.21	0.94

OMNI-Test Laboratories, Inc.

Wood Heater Test Data

7

Run: 4

Manufacturer: Hearth & Home
Model: Dauntless NC
Tracking No.: 2389
Project No.: 061WS104E
Test Date: 05-Oct-19
Beginning Clock Time: 12:41

Total Sampling Time: 586 min
Recording Interval: 1 min
Background Sample Volume: ____ cubic feet

Meter Box Y Factor: 0.992 (1) 0.989 (2) ____ (Amb)

Barometric Pressure:

Begin	Middle	End	Average
29.87		29.78	29.83 0

OMNI Equipment Numbers: ____

PM Control Modules: 371, 372
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.282 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 18.88 ft/sec.
Initial Tunnel Flow: 213.4 acfm
Average Tunnel Flow: 209.2 scfm
Post-Test Leak Check (1): 0.000 cfm @ 6 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ 10 in. Hg
Average Test Piece Fuel Moisture: 22.83 Dry Basis %

Technician Signature: ____

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.074	0.082	0.084	0.080	0.074	0.084	0.084	0.076	0.084	"H2O
Temp:	79	79	79	79	79	79	79	79	79	°F

V_{straw} 18.98 ft/sec V_{scent} 19.43 ft/sec F_p 0.977

	Particulate Sampling Data													Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst Exit	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
37	6.029	6.393	0.16	0.17	2.26	83	0	1.78	81	-3.4	95	0.080	101	100	18.8	-0.1	233	247	264	181	290	243	1344	294	83	48	85	47	78	-0.040	11.06	0.77
38	6.193	6.566	0.16	0.17	2.26	83	0.32	1.77	81	-3.3	96	0.080	101	101	18.6	-0.1	232	245	263	184	289	243	1370	304	83	48	85	47	78	-0.041	11.94	0.53
39	6.357	6.739	0.16	0.17	2.26	83	0.18	1.77	81	-3.3	96	0.080	101	101	18.6	-0.1	231	243	261	187	288	242	1389	312	84	48	85	47	78	-0.042	12.89	0.34
40	6.522	6.911	0.17	0.17	2.26	83	0.4	1.76	81	-3.2	97	0.080	102	100	18.4	-0.1	230	241	260	191	286	242	1396	319	84	48	85	47	78	-0.043	13.47	0.23
41	6.686	7.084	0.16	0.17	2.25	83	0.28	1.76	81	-3.4	97	0.080	101	101	18.3	-0.2	229	240	259	194	285	241	1413	324	84	48	86	47	78	-0.043	13.89	0.18
42	6.850	7.257	0.16	0.17	2.26	83	-0.01	1.77	81	-3.4	97	0.080	101	101	18.2	-0.1	229	238	258	197	284	241	1410	329	84	48	86	47	78	-0.043	14.02	0.15
43	7.015	7.430	0.17	0.17	2.26	83	0.02	1.77	81	-3.4	97	0.080	102	101	18.1	-0.1	229	237	257	200	282	241	1425	332	84	49	86	47	78	-0.044	14.11	0.15
44	7.179	7.602	0.16	0.17	2.25	83	0.45	1.76	81	-3.4	98	0.090	95	95	18.0	-0.1	229	235	256	203	281	241	1435	337	84	49	86	47	78	-0.045	14.23	0.21
45	7.343	7.774	0.16	0.17	2.26	83	-0.03	1.76	81	-3.4	98	0.090	95	95	17.8	-0.2	229	234	255	206	280	241	1469	340	84	49	86	47	78	-0.045	14.4	0.25
46	7.507	7.947	0.16	0.17	2.26	83	0.45	1.76	81	-3.3	98	0.080	101	101	17.7	-0.1	229	233	254	209	279	241	1482	342	84	49	86	47	78	-0.046	14.45	0.26
47	7.672	8.119	0.17	0.17	2.26	83	0.45	1.76	81	-3.1	99	0.080	102	101	17.7	-0.1	230	231	254	212	278	241	1509	347	84	49	86	47	78	-0.047	14.55	0.28
48	7.836	8.292	0.16	0.17	2.25	83	0.3	1.76	81	-3.2	99	0.080	101	101	17.5	-0.2	230	230	253	215	277	241	1508	349	84	49	86	48	78	-0.047	14.6	0.26
49	8.000	8.464	0.16	0.17	2.25	83	-0.11	1.75	81	-3.3	99	0.080	101	101	17.4	-0.1	231	229	253	217	276	241	1514	352	84	49	86	48	78	-0.047	14.64	0.24
50	8.164	8.637	0.16	0.17	2.24	83	0.35	1.75	81	-3.2	100	0.080	101	101	17.3	-0.1	232	229	252	220	275	242	1523	355	84	49	86	48	78	-0.047	14.64	0.26
51	8.328	8.809	0.16	0.17	2.24	83	0.11	1.81	81	-3.2	100	0.080	101	101	17.1	-0.2	232	228	252	222	274	242	1526	358	84	49	85	48	78	-0.047	14.75	0.22
52	8.492	8.985	0.16	0.18	2.26	83	-0.09	1.81	81	-3.2	100	0.080	101	103	17.1	0.0	233	227	252	225	273	242	1532	357	84	50	85	48	78	-0.048	14.76	0.17
53	8.656	9.159	0.16	0.17	2.26	83	0.42	1.79	81	-3.2	100	0.080	101	102	16.9	-0.2	235	226	251	227	272	242	1538	358	84	50	85	48	78	-0.048	14.67	0.15
54	8.821	9.333	0.16	0.17	2.26	83	-0.1	1.80	81	-3.5	100	0.080	102	102	16.8	-0.2	236	225	252	229	271	243	1528	360	83	50	85	48	78	-0.048	14.63	0.13
55	8.985	9.508	0.16	0.17	2.24	83	0.38	1.81	81	-3.4	100	0.080	101	103	16.7	-0.1	237	225	252	231	271	243	1534	361	83	50	85	48	78	-0.048	14.6	0.1
56	9.149	9.682	0.16	0.17	2.26	83	-0.01	1.79	81	-3.3	100	0.080	101	102	16.6	-0.1	239	224	252	233	270	244	1545	362	83	50	85	48	78	-0.048	14.52	0.07
57	9.314	9.857	0.17	0.17	2.24	83	0.06	1.79	81	-3.5	100	0.080	102	103	16.4	-0.2	240	223	252	235	270	244	1549	363	84	50	85	48	78	-0.048	14.51	0.05
58	9.478	10.031	0.16	0.17	2.24	83	0.45	1.80	82	-3.3	100	0.080	101	102	16.3	-0.1	241	223	253	237	269	245	1564	364	84	50	86	48	78	-0.048	14.57	0.05
59	9.642	10.205	0.16	0.17	2.26	83	0.26	1.80	82	-3.3	101	0.080	101	102	16.2	-0.1	242	223	253	238	268	245	1557	363	84	50	86	48	78	-0.048	14.53	0.05
60	9.806	10.380	0.16	0.18	2.26	83	-0.01	1.80	82	-3.2	100	0.080	101	102	16.2	-0.1	244	222	254	240	268	246	1545	364	84	50	86	48	78	-0.048	14.48	0.05
61	9.971	10.554	0.17	0.17	2.12	83	0.16	1.81	81	-3.4	101	0.080	102	102	16.0	-0.2	245	221	253	241	268	246	1536	364	84	50	86	48	78	-0.048	14.46	0.06
62	10.134	10.729	0.16	0.17	2.27	83	0.04	1.80	82	-3.4	101	0.080	101	102	15.9	-0.1	246	221	254	242	267	246	1539	363	85	51	86	48	78	-0.048	14.36	0.06
63	10.299	10.903	0.16	0.17	2.27	83	0.48	1.80	82	-3.5	101	0.080	102	102	15.8	-0.1	248	221	255	243	267	247	1540	363	85	51	86	48	78	-0.048	14.26	0.05
64	10.465	11.078	0.17	0.17	2.27	83	0.5	1.81	82	-3.4	101	0.080	103	102	15.7	-0.1	249	221	255	244	267	247	1556	363	85	51	86	49	78	-0.048	14.19	0.05
65	10.629	11.252	0.16	0.17	2.26	83	0.31	1.81	82	-3.4	101	0.080	101	102	15.6	-0.1	250	220	256	244	267	247	1555	363	85	51	86	49	78	-0.048	14.14	0.04
66	10.794	11.426	0.17	0.17	2.27	83	0.1	1.80	82	-3.2	101	0.080	102	102	15.5	-0.1	252	220	257	245	266	248	1569	363	85	51	86	49	78	-0.048	14.03	0.04
67	10.959	11.602	0.16	0.18	2.28	83	0.51	1.80	82	-3.3	101	0.080	102	103	15.4	-0.1	254	220	257	246	266	249	1520	362	85	51	86	49	78	-0.048	13.99	0.04
68	11.124	11.776	0.17	0.17	2.26	83	0.03	1.81	82	-3.5	101	0.080	102	102	15.2	-0.1	257	219	258	247	266	249	1536	364	85	51	86	49	78	-0.049	14	0.04
69	11.289	11.950	0.16	0.17	2.26	83	0.52	1.81	82	-3.5	102	0.080	102	102	15.1	-0.1	260	219	259	248	266	250	1544	366	85	51	86	49	78	-0.049	14	0.03
70	11.453	12.125	0.16	0.18	2.27	83	0.16	1.80	82	-3.5	102	0.080	101	102	15.0	-0.1	263	219	260	249	266	251	1542	368	85	51	85	49	78	-0.049	14.44	0.05
71	11.618	12.299	0.17	0.17	2.27	83	0.13	1.81	82	-3.5	102	0.080	102	102	14.9	-0.1	266	219	262	250	265	252	1544	369	85	51	85	49	78	-0.049	14.65	0.07
72	11.784	12.474	0.17	0.18	2.27	83	0.04	1.80	82	-3.3	102	0.090	97	97	14.8	-0.1	269	219	263	250	266	253	1542	368	85	51	85	49	78	-0.049	14.62	0.06
73	11.948	12.648	0.16	0.17	2.27	83	0.09	1.79	82	-3.3	102	0.080	101	102	14.7	-0.2	271	219	264	251	266	254	1535	368	85	51	85	49	78	-0.049	14.48	0.04

Wood Heater Test Data

7

Run: 4

Manufacturer: Hearth & Home
Model: Dauntless NC
Tracking No.: 2389
Project No.: 061WS104E
Test Date: 05-Oct-19
Beginning Clock Time: 12:41

Total Sampling Time: 586 min
Recording Interval: 1 min
Background Sample Volume: ____ cubic feet

Meter Box Y Factor: 0.992 (1) 0.989 (2) ____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	29.87		29.78	29.83 0

OMNI Equipment Numbers: ____

PM Control Modules: 371, 372
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.282 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 18.88 ft/sec.
Initial Tunnel Flow: 213.4 acfm
Average Tunnel Flow: 209.2 scfm
Post-Test Leak Check (1): 0.000 cfm @ 6 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ 10 in. Hg
Average Test Piece Fuel Moisture: 22.83 Dry Basis %

Technician Signature: ____

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.074	0.082	0.084	0.080	0.074	0.084	0.084	0.076	0.084	"H2O
Temp:	79	79	79	79	79	79	79	79	79	°F

V_{straw} 18.98 ft/sec V_{scent} 19.43 ft/sec F_p 0.977

	Particulate Sampling Data													Fuel Weight (lb)		Temperature Data (°F)											Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst Exit	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
74	12.112	12.823	0.16	0.18	2.27	83	0.52	1.80	82	-3.2	102	0.080	101	102	14.5	-0.1	274	219	266	252	266	255	1535	368	84	51	85	49	78	-0.049	14.36	0.03
75	12.277	12.997	0.16	0.17	2.27	83	-0.01	1.80	82	-3.3	102	0.080	102	102	14.4	-0.2	277	219	268	252	266	256	1543	370	84	52	85	49	78	-0.050	14.35	0.02
76	12.443	13.171	0.17	0.17	2.27	83	-0.03	1.79	82	-3.3	102	0.080	103	102	14.3	-0.1	279	219	269	253	265	257	1557	374	84	52	85	49	78	-0.050	14.47	0.04
77	12.607	13.346	0.16	0.18	2.26	83	0.34	1.78	82	-3.3	103	0.080	102	103	14.1	-0.2	283	219	271	254	265	258	1560	380	84	52	85	50	78	-0.051	14.97	0.34
78	12.771	13.520	0.16	0.17	2.27	83	0.08	1.81	82	-3.3	103	0.080	102	102	14.1	-0.1	286	219	273	256	266	260	1560	384	84	52	86	50	78	-0.051	15.3	0.7
79	12.937	13.694	0.17	0.17	2.27	83	0	1.79	82	-3.3	103	0.090	97	96	13.9	-0.2	289	219	275	258	266	261	1573	385	84	52	86	50	78	-0.051	15.43	1.03
80	13.101	13.869	0.16	0.17	2.25	83	0.02	1.79	82	-3.3	103	0.080	102	103	13.7	-0.2	292	220	277	259	266	263	1579	387	83	52	86	50	78	-0.052	15.43	1.23
81	13.265	14.043	0.16	0.17	2.26	83	0.09	1.81	82	-3.5	103	0.080	102	102	13.6	-0.1	295	220	279	260	266	264	1576	387	83	52	86	50	78	-0.051	15.45	1.04
82	13.430	14.217	0.16	0.17	2.27	83	0.33	1.80	82	-3.4	103	0.080	102	102	13.5	-0.1	297	220	282	261	266	265	1584	386	83	52	86	50	78	-0.051	15.47	0.74
83	13.595	14.392	0.17	0.17	2.24	83	0.45	1.79	82	-3.4	103	0.080	102	103	13.4	-0.2	300	220	284	262	266	268	1575	386	84	52	86	50	78	-0.051	15.4	0.49
84	13.759	14.566	0.16	0.17	2.25	83	0	1.80	82	-3.5	103	0.080	102	102	13.3	-0.1	302	221	286	263	267	268	1576	384	84	52	86	50	79	-0.051	15.27	0.32
85	13.923	14.740	0.16	0.17	2.27	83	0.23	1.80	82	-3.2	103	0.090	96	96	13.2	-0.2	305	221	289	264	267	269	1560	381	84	52	86	50	79	-0.051	15.25	0.26
86	14.088	14.915	0.16	0.17	2.27	83	-0.04	1.80	82	-3.3	103	0.080	102	103	13.0	-0.1	308	221	291	265	267	270	1553	379	84	52	86	50	79	-0.050	15.16	0.17
87	14.253	15.089	0.17	0.17	2.26	83	-0.01	1.80	82	-3.5	103	0.080	102	102	13.0	-0.1	310	221	294	266	267	272	1540	376	85	52	86	50	78	-0.050	14.97	0.11
88	14.417	15.263	0.16	0.17	2.25	83	0.24	1.81	82	-3.5	103	0.090	96	96	12.8	-0.1	313	221	296	265	267	272	1527	374	85	52	86	50	79	-0.049	14.78	0.07
89	14.581	15.438	0.16	0.18	2.25	83	0.5	1.79	82	-3.3	103	0.080	102	103	12.8	-0.1	315	222	299	265	268	274	1522	371	85	52	86	50	79	-0.049	14.54	0.04
90	14.746	15.612	0.17	0.17	2.26	83	0.19	1.80	82	-3.3	103	0.080	102	102	12.6	-0.1	317	222	301	265	268	275	1512	370	85	52	86	50	79	-0.049	14.39	0.03
91	14.910	15.787	0.16	0.18	2.24	83	-0.04	1.79	82	-3.3	103	0.080	102	103	12.5	-0.2	318	222	303	265	268	275	1505	368	85	53	85	51	79	-0.048	14.24	0.02
92	15.074	15.961	0.16	0.17	2.25	83	0.31	1.80	82	-3.4	103	0.090	96	96	12.4	-0.1	320	222	306	264	268	276	1505	366	85	53	85	51	79	-0.048	14.21	0.02
93	15.238	16.135	0.16	0.17	2.26	83	0.44	1.80	82	-3.2	103	0.080	102	102	12.3	-0.1	322	223	308	264	268	277	1519	366	85	53	85	51	78	-0.048	14.16	0.02
94	15.403	16.310	0.17	0.17	2.26	83	0.29	1.80	82	-3.5	103	0.080	102	103	12.2	-0.1	323	223	310	263	269	278	1516	365	85	53	85	51	79	-0.048	14.12	0.03
95	15.567	16.484	0.16	0.17	2.24	83	0.09	1.81	82	-3.2	103	0.080	102	102	12.1	-0.1	324	223	313	262	269	278	1555	368	85	53	85	51	79	-0.049	14.03	0.03
96	15.731	16.659	0.16	0.17	2.25	83	0.25	1.80	82	-3.2	103	0.090	96	97	11.9	-0.2	327	223	316	263	269	280	1570	373	85	53	85	51	79	-0.050	14.43	0.09
97	15.896	16.833	0.17	0.17	2.23	83	0.4	1.79	82	-3.4	103	0.080	102	102	11.9	-0.1	330	224	319	264	270	281	1572	377	85	53	85	51	79	-0.050	15	0.27
98	16.059	17.007	0.16	0.17	2.24	83	0.42	1.80	82	-3.4	104	0.080	101	102	11.7	-0.2	333	224	322	265	270	283	1564	382	85	53	85	51	79	-0.051	15.2	0.7
99	16.223	17.181	0.16	0.17	2.25	83	-0.01	1.80	82	-3.4	104	0.080	102	102	11.7	0.0	336	224	324	266	270	284	1555	382	85	53	86	51	79	-0.050	15.34	1.1
100	16.387	17.355	0.16	0.17	2.25	83	0.09	1.79	82	-3.3	104	0.080	102	102	11.5	-0.2	340	225	328	267	271	286	1553	383	85	53	86	51	79	-0.051	15.26	1.43
101	16.551	17.530	0.16	0.18	2.24	83	0.12	1.79	82	-3.3	104	0.080	102	103	11.3	-0.2	344	225	331	268	271	288	1560	385	85	53	86	51	79	-0.051	15.24	1.59
102	16.715	17.704	0.16	0.17	2.24	83	-0.03	1.79	82	-3.4	105	0.080	102	102	11.2	-0.1	347	226	333	269	272	289	1555	388	85	53	86	51	79	-0.051	15.2	1.58
103	16.878	17.878	0.16	0.17	2.25	83	0.2	1.79	82	-3.5	105	0.080	101	102	11.1	-0.1	353	226	336	270	272	291	1559	387	84	53	86	52	79	-0.051	15.25	1.6
104	17.043	18.052	0.16	0.17	2.25	83	-0.03	1.79	82	-3.5	104	0.080	102	102	10.9	-0.1	357	227	338	271	272	293	1557	385	84	53	86	52	79	-0.050	15.23	1.56
105	17.206	18.226	0.16	0.17	2.23	83	0.22	1.79	82	-3.5	104	0.080	101	102	10.8	-0.1	361	228	341	272	273	295	1562	386	84	53	86	52	79	-0.052	15.29	1.4
106	17.370	18.400	0.16	0.17	2.24	83	0.47	1.79	82	-3.3	104	0.080	102	102	10.7	-0.1	363	228	343	273	273	296	1558	385	84	53	86	52	79	-0.053	15.32	1.24
107	17.535	18.574	0.16	0.17	2.23	83	0.03	1.78	82	-3.3	103	0.080	102	102	10.6	-0.1	366	229	345	274	273	297	1566	382	84	53	86	52	79	-0.050	15.33	1.08
108	17.698	18.748	0.16	0.17	2.22	83	0.51	1.78	82	-3.2	104	0.080	101	102	10.4	-0.2	368	229	347	274	274	298	1544	381	84	53	86	52	79	-0.050	15.31	0.95
109	17.862	18.922	0.16	0.17	2.24	83	0.18	1.80	82	-3.5	104	0.080	102	102	10.4	-0.1	370	230	349	275	273	299	1532	380	84	53	86	52	79	-0.050	15.32	0.85
110	18.026	19.097	0.16	0.18	2.23	83	0.51	1.80	82	-3.2	104	0.080	102	103	10.2	-0.1	373	230	351	275	274	301	1537	376	84	53	86	52	79	-0.049	15.25	0.79

Wood Heater Test Data

7

Run: 4

Manufacturer: Hearth & Home
Model: Dauntless NC
Tracking No.: 2389
Project No.: 061WS104E
Test Date: 05-Oct-19
Beginning Clock Time: 12:41

Total Sampling Time: 586 min
Recording Interval: 1 min
Background Sample Volume: ____ cubic feet

Meter Box Y Factor: 0.992 (1) 0.989 (2) ____ (Amb)

Barometric Pressure: Begin 29.87 Middle ____ End 29.78 Average 29.83 0

OMNI Equipment Numbers: ____

PM Control Modules: 371, 372
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.282 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 18.88 ft/sec.
Initial Tunnel Flow: 213.4 acfm
Average Tunnel Flow: 209.2 scfm
Post-Test Leak Check (1): 0.000 cfm @ 6 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ 10 in. Hg
Average Test Piece Fuel Moisture: 22.83 Dry Basis %

Technician Signature: ____

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.074	0.082	0.084	0.080	0.074	0.084	0.084	0.076	0.084	"H2O
Temp:	79	79	79	79	79	79	79	79	79	°F

V_{straw} 18.98 ft/sec V_{scent} 19.43 ft/sec F_p 0.977

	Particulate Sampling Data													Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst Exit	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
111	18.190	19.270	0.16	0.17	2.22	83	0.06	1.78	82	-3.5	104	0.080	102	102	10.2	-0.1	375	231	353	275	274	302	1543	378	83	53	85	52	79	-0.051	15.1	0.84
112	18.353	19.444	0.16	0.17	2.22	83	0.29	1.79	82	-3.5	104	0.080	101	102	10.0	-0.2	377	232	354	275	275	303	1532	374	84	54	85	52	79	-0.051	15.22	0.71
113	18.517	19.619	0.16	0.18	2.24	83	0.5	1.79	82	-3.2	104	0.080	102	103	9.9	-0.1	379	232	356	275	275	303	1518	373	84	54	85	52	80	-0.050	15.09	0.69
114	18.681	19.792	0.16	0.17	2.23	83	0.27	1.79	82	-3.5	103	0.080	102	101	9.8	-0.1	381	233	358	275	275	304	1520	372	84	54	85	52	79	-0.048	14.94	0.65
115	18.844	19.967	0.16	0.17	2.23	83	0.21	1.79	82	-3.2	104	0.080	101	103	9.7	-0.1	382	233	359	275	276	305	1524	370	84	54	85	52	80	-0.048	14.98	0.68
116	19.008	20.140	0.16	0.17	2.24	83	0.51	1.80	82	-3.5	103	0.080	102	101	9.6	-0.1	383	234	360	274	276	305	1520	369	85	54	85	53	80	-0.048	14.89	0.64
117	19.172	20.315	0.16	0.18	2.23	83	0.45	1.80	82	-3.2	104	0.080	102	103	9.5	-0.1	384	234	361	274	276	306	1519	368	85	54	85	53	79	-0.049	14.85	0.64
118	19.335	20.489	0.16	0.17	2.23	83	-0.05	1.78	82	-3.3	104	0.080	101	102	9.4	-0.1	385	235	362	274	277	307	1521	367	85	54	85	53	80	-0.048	14.9	0.64
119	19.499	20.663	0.16	0.17	2.23	84	-0.03	1.79	82	-3.5	104	0.080	101	102	9.3	-0.2	386	235	363	274	277	307	1536	367	85	54	85	53	80	-0.049	14.83	0.69
120	19.663	20.837	0.16	0.17	2.23	83	0.46	1.80	82	-3.4	104	0.080	102	102	9.1	-0.1	388	236	364	274	277	308	1543	367	85	54	86	53	80	-0.050	14.9	0.79
121	19.825	21.011	0.16	0.17	2.22	83	0.4	1.79	82	-3.3	103	0.080	100	102	9.1	0.0	388	236	365	274	278	308	1551	365	85	54	86	53	80	-0.048	14.88	1.03
122	19.989	21.185	0.16	0.17	2.23	83	0.49	1.78	82	-3.5	103	0.080	102	102	8.9	-0.2	387	237	367	274	277	308	1554	364	85	54	86	53	79	-0.048	14.92	1.47
123	20.153	21.359	0.16	0.17	2.22	84	0.1	1.79	82	-3.4	103	0.080	101	102	8.9	0.0	388	237	368	274	278	309	1548	363	85	54	86	53	80	-0.049	14.99	1.28
124	20.316	21.533	0.16	0.17	2.25	84	0.41	1.79	82	-3.3	103	0.080	101	102	8.7	-0.1	390	237	369	274	278	310	1543	358	85	54	86	53	80	-0.047	14.86	1.09
125	20.481	21.707	0.17	0.17	2.26	84	0.22	1.78	82	-3.5	103	0.080	102	102	8.7	-0.1	392	238	370	274	278	310	1530	353	85	54	86	54	80	-0.046	14.7	0.86
126	20.645	21.881	0.16	0.17	2.27	84	-0.04	1.78	82	-3.3	103	0.080	101	102	8.5	-0.1	392	238	371	273	278	310	1526	348	85	54	86	54	80	-0.046	14.3	0.56
127	20.810	22.055	0.16	0.17	2.25	84	0.26	1.79	82	-3.2	102	0.080	102	102	8.5	0.0	392	239	371	272	278	310	1526	345	85	54	86	54	80	-0.050	14.01	0.32
128	20.975	22.229	0.17	0.17	2.26	84	0.39	1.79	82	-3.4	102	0.080	102	102	8.5	0.0	392	239	372	271	279	311	1554	343	85	54	86	54	79	-0.045	13.74	0.24
129	21.139	22.403	0.16	0.17	2.27	84	-0.07	1.78	82	-3.2	102	0.080	101	102	8.4	-0.1	390	239	372	271	279	310	1566	342	85	54	86	54	80	-0.045	13.75	0.23
130	21.305	22.577	0.17	0.17	2.27	84	0	1.79	82	-3.5	102	0.080	102	102	8.3	-0.1	388	240	372	270	279	310	1568	340	85	55	86	54	79	-0.044	14.3	0.3
131	21.469	22.751	0.16	0.17	2.24	84	0.31	1.79	82	-3.4	102	0.080	101	102	8.2	-0.1	386	240	372	269	279	309	1569	338	85	55	85	54	80	-0.044	14.24	0.23
132	21.633	22.924	0.16	0.17	2.25	84	0.13	1.78	82	-3.3	102	0.090	95	96	8.1	-0.1	384	240	371	269	279	309	1565	336	85	55	85	54	80	-0.044	14.01	0.12
133	21.798	23.099	0.16	0.18	2.27	84	0.04	1.79	82	-3.4	102	0.080	102	102	8.0	-0.1	383	240	370	267	279	308	1556	334	84	55	85	54	80	-0.043	13.79	0.07
134	21.963	23.272	0.17	0.17	2.26	84	0.27	1.80	82	-3.4	102	0.080	102	101	7.9	-0.1	382	240	370	267	279	308	1565	332	84	55	85	54	80	-0.043	13.68	0.04
135	22.127	23.447	0.16	0.18	2.25	84	0.48	1.79	82	-3.4	102	0.080	101	102	7.9	0.0	380	240	370	266	279	307	1527	331	84	55	85	54	80	-0.043	13.62	0.03
136	22.292	23.621	0.17	0.17	2.26	84	0.04	1.78	82	-3.5	101	0.080	102	102	7.8	-0.1	380	240	369	265	279	307	1508	330	84	55	85	55	79	-0.043	13.51	0.02
137	22.456	23.795	0.16	0.17	2.27	84	0.09	1.78	82	-3.2	101	0.080	101	102	7.8	0.0	380	241	369	265	279	307	1502	329	84	55	85	55	79	-0.042	13.45	0.02
138	22.622	23.969	0.17	0.17	2.25	84	0.24	1.80	82	-3.3	101	0.090	97	96	7.7	-0.1	382	241	368	263	279	307	1464	327	84	55	85	55	80	-0.042	13.11	0.06
139	22.786	24.143	0.16	0.17	2.25	84	0.29	1.79	82	-3.2	101	0.080	101	102	7.6	-0.1	381	241	368	262	279	306	1443	323	83	55	85	55	80	-0.042	12.84	0.09
140	22.950	24.317	0.16	0.17	2.26	84	0.12	1.78	82	-3.2	101	0.080	101	102	7.6	-0.1	382	241	368	260	279	306	1446	322	83	55	85	55	79	-0.042	12.49	0.02
141	23.115	24.491	0.16	0.17	2.25	84	0.16	1.80	82	-3.5	101	0.080	102	102	7.5	0.0	381	242	368	259	279	306	1442	321	83	55	86	55	79	-0.043	12.24	0.01
142	23.280	24.665	0.17	0.17	2.24	84	-0.05	1.79	82	-3.3	100	0.080	102	102	7.4	-0.1	381	242	368	257	279	305	1432	319	83	55	86	55	80	-0.041	12.17	0.04
143	23.444	24.839	0.16	0.17	2.24	84	0.07	1.78	82	-3.5	101	0.090	95	96	7.4	0.0	382	242	368	256	279	305	1437	319	84	55	86	55	80	-0.042	12.37	0.01
144	23.609	25.014	0.17	0.18	2.25	84	-0.07	1.77	82	-3.3	100	0.080	102	102	7.3	-0.1	384	242	368	255	279	306	1438	318	84	56	86	55	79	-0.041	12.46	0.06
145	23.774	25.187	0.16	0.17	2.26	84	0.01	1.79	82	-3.2	100	0.080	102	101	7.2	-0.1	383	242	369	254	279	305	1483	321	84	56	86	55	80	-0.042	12.47	0.07
146	23.937	25.361	0.16	0.17	2.24	84	0.43	1.79	82	-3.5	100	0.080	100	102	7.1	-0.1	381	242	368	254	279	305	1497	322	84	56	86	55	80	-0.042	12.89	0.05
147	24.102	25.535	0.16	0.17	2.25	84	0.3	1.78	82	-3.3	100	0.080	102	102	7.0	0.0	380	242	368	254	278	304	1513	325	85	56	86	55	80	-0.042	13.4	0.06

Wood Heater Test Data

7

Run: 4

Manufacturer: Hearth & Home
Model: Dauntless NC
Tracking No.: 2389
Project No.: 061WS104E
Test Date: 05-Oct-19
Beginning Clock Time: 12:41

Total Sampling Time: 586 min
Recording Interval: 1 min
Background Sample Volume: _____ cubic feet

Meter Box Y Factor: 0.992 (1) 0.989 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	29.87		29.78	29.83 0

OMNI Equipment Numbers: _____

PM Control Modules: 371, 372
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.282 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 18.88 ft/sec.
Initial Tunnel Flow: 213.4 acfm
Average Tunnel Flow: 209.2 scfm
Post-Test Leak Check (1): 0.000 cfm @ 6 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ 10 in. Hg
Average Test Piece Fuel Moisture: 22.83 Dry Basis %

Technician Signature: _____

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.074	0.082	0.084	0.080	0.074	0.084	0.084	0.076	0.084	"H2O
Temp:	79	79	79	79	79	79	79	79	79	°F

V_{straw} 18.98 ft/sec V_{scent} 19.43 ft/sec F_p 0.977

	Particulate Sampling Data													Fuel Weight (lb)		Temperature Data (°F)											Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst Exit	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
148	24.266	25.709	0.16	0.17	2.25	84	-0.08	1.79	82	-3.4	100	0.080	101	102	7.0	-0.1	379	243	368	255	278	305	1532	326	85	56	86	55	80	-0.042	13.79	0.1
149	24.431	25.884	0.17	0.18	2.24	84	-0.03	1.79	82	-3.4	101	0.080	102	102	6.9	-0.1	378	243	368	256	278	305	1537	328	85	56	86	56	80	-0.043	14	0.15
150	24.595	26.057	0.16	0.17	2.24	84	0.08	1.78	82	-3.3	101	0.080	101	101	6.8	-0.1	377	243	367	258	278	305	1546	331	85	56	85	56	80	-0.043	14.13	0.21
151	24.759	26.232	0.16	0.18	2.24	84	0.43	1.78	82	-3.3	100	0.080	101	102	6.8	0.0	377	243	366	259	277	304	1548	332	85	56	85	56	80	-0.043	14.36	0.27
152	24.923	26.405	0.16	0.17	2.24	84	0.05	1.79	82	-3.4	101	0.080	101	101	6.6	-0.1	377	243	366	260	277	305	1552	332	85	56	85	56	80	-0.043	14.35	0.31
153	25.087	26.579	0.16	0.17	2.24	84	0.09	1.79	82	-3.5	101	0.080	101	102	6.6	0.0	377	243	365	261	277	305	1554	333	85	56	85	56	80	-0.043	14.37	0.32
154	25.251	26.753	0.16	0.17	2.24	84	-0.07	1.78	82	-3.4	100	0.090	95	96	6.5	-0.1	376	243	365	262	278	305	1556	334	85	56	85	56	80	-0.043	14.35	0.31
155	25.416	26.927	0.16	0.17	2.25	84	-0.08	1.78	82	-3.4	101	0.080	102	102	6.5	0.0	375	243	364	262	277	304	1558	334	85	56	85	56	80	-0.043	14.34	0.28
156	25.580	27.101	0.16	0.17	2.22	84	-0.03	1.79	82	-3.3	100	0.080	101	102	6.3	-0.1	375	243	364	263	278	305	1558	332	85	56	85	56	80	-0.043	14.33	0.25
157	25.743	27.275	0.16	0.17	2.23	84	0.06	1.79	82	-3.4	101	0.080	101	102	6.3	0.0	375	243	363	263	277	304	1556	332	85	56	85	56	80	-0.043	14.18	0.19
158	25.907	27.449	0.16	0.17	2.24	84	0.47	1.78	82	-3.5	100	0.080	101	102	6.3	0.0	374	244	363	264	277	304	1554	330	85	56	85	56	80	-0.042	14.12	0.16
159	26.071	27.622	0.16	0.17	2.22	84	0.39	1.79	82	-3.4	100	0.090	95	95	6.1	-0.1	373	244	363	264	277	304	1552	329	84	56	85	56	80	-0.042	13.87	0.11
160	26.235	27.797	0.16	0.18	2.23	84	0.17	1.79	82	-3.4	101	0.080	101	102	6.1	0.0	373	244	362	264	277	304	1550	328	84	56	86	56	80	-0.042	13.7	0.09
161	26.399	27.971	0.16	0.17	2.24	84	0.11	1.78	82	-3.3	100	0.080	101	102	6.1	0.0	373	244	362	264	277	304	1550	327	84	56	86	56	80	-0.042	13.66	0.07
162	26.563	28.145	0.16	0.17	2.22	84	0.3	1.78	82	-3.3	100	0.080	101	102	5.9	-0.1	373	244	361	264	277	304	1542	325	84	57	86	56	79	-0.042	13.56	0.05
163	26.726	28.318	0.16	0.17	2.23	84	-0.09	1.79	82	-3.2	100	0.080	100	101	5.9	0.0	374	244	361	264	277	304	1543	324	84	57	86	56	80	-0.041	13.43	0.04
164	26.890	28.492	0.16	0.17	2.24	84	0.43	1.79	82	-3.3	100	0.080	101	102	5.9	0.0	374	245	360	263	277	304	1530	322	84	57	86	57	80	-0.041	13.31	0.03
165	27.054	28.666	0.16	0.17	2.24	84	-0.07	1.78	82	-3.2	100	0.080	101	102	5.7	-0.1	375	245	360	263	276	304	1526	321	84	57	86	57	79	-0.041	13.1	0.02
166	27.218	28.840	0.16	0.17	2.22	84	0.24	1.77	82	-3.4	100	0.080	101	102	5.7	0.0	375	245	360	262	276	304	1516	319	83	57	86	57	80	-0.041	12.93	0.01
167	27.381	29.014	0.16	0.17	2.24	84	0.04	1.79	82	-3.3	100	0.080	100	102	5.7	-0.1	375	246	359	261	276	303	1511	318	83	57	86	57	80	-0.040	12.69	0.01
168	27.545	29.187	0.16	0.17	2.24	84	0.26	1.79	82	-3.3	99	0.080	101	101	5.6	-0.1	376	246	359	260	276	303	1507	316	83	57	86	57	80	-0.040	12.63	0
169	27.711	29.361	0.17	0.17	2.31	84	0.41	1.78	82	-3.4	99	0.080	102	102	5.5	0.0	377	246	358	260	276	303	1496	316	83	57	85	57	80	-0.040	12.64	0
170	27.877	29.535	0.17	0.17	2.30	84	-0.12	1.79	82	-3.3	100	0.080	102	102	5.5	0.0	377	247	358	259	276	303	1500	316	83	57	85	57	80	-0.041	12.69	0
171	28.043	29.709	0.17	0.17	2.30	84	0.43	1.78	82	-3.3	99	0.080	102	102	5.4	-0.1	378	247	358	258	276	303	1499	315	84	57	85	57	80	-0.040	12.67	0
172	28.210	29.883	0.17	0.17	2.30	84	-0.07	1.78	82	-3.2	99	0.080	103	102	5.3	0.0	378	248	358	257	276	303	1497	315	84	57	85	57	80	-0.040	12.74	0
173	28.377	30.057	0.17	0.17	2.31	84	0.42	1.78	82	-3.5	99	0.080	103	102	5.3	0.0	378	248	357	256	276	303	1501	314	84	57	85	57	80	-0.039	12.63	0
174	28.543	30.231	0.17	0.17	2.29	84	-0.12	1.79	82	-3.5	99	0.090	96	96	5.2	-0.1	379	248	357	255	276	303	1491	313	85	57	85	57	80	-0.040	12.62	0
175	28.709	30.405	0.17	0.17	2.29	84	0.41	1.79	82	-3.5	99	0.080	102	102	5.2	0.0	379	248	358	255	276	303	1484	312	85	57	85	57	80	-0.040	12.67	0
176	28.875	30.579	0.17	0.17	2.29	84	0.3	1.78	82	-3.3	99	0.080	102	102	5.1	0.0	379	249	357	252	276	303	1466	311	85	57	85	57	80	-0.039	12.61	0
177	29.042	30.753	0.17	0.17	2.31	84	0.05	1.80	82	-3.4	99	0.080	103	102	5.1	0.0	379	249	357	252	276	303	1493	311	85	57	85	57	80	-0.039	12.54	0
178	29.209	30.927	0.17	0.17	2.31	84	0.44	1.79	82	-3.2	99	0.080	103	102	5.0	-0.1	379	250	357	252	276	303	1500	311	85	57	86	57	80	-0.039	12.64	0
179	29.375	31.100	0.17	0.17	2.30	84	0.06	1.79	82	-3.5	99	0.080	102	101	5.0	0.0	380	250	357	252	276	303	1508	311	85	57	86	57	80	-0.040	13.01	0.02
180	29.541	31.274	0.17	0.17	2.28	84	0.29	1.78	82	-3.5	99	0.080	102	102	4.9	-0.1	380	251	357	251	275	303	1505	312	85	57	86	57	80	-0.040	13.04	0.04
181	29.707	31.448	0.17	0.17	2.30	84	0.09	1.79	82	-3.5	99	0.080	102	102	4.8	-0.1	380	251	357	251	275	303	1521	313	85	58	86	57	79	-0.040	13.2	0.04
182	29.873	31.622	0.17	0.17	2.30	84	-0.1	1.78	82	-3.4	99	0.080	102	102	4.8	0.0	380	251	356	251	275	303	1512	313	85	58	86	58	80	-0.039	13.25	0.04
183	30.040	31.796	0.17	0.17	2.30	84	0.26	1.78	82	-3.5	99	0.080	103	102	4.7	-0.1	380	251	357	251	275	303	1526	313	85	58	86	58	80	-0.040	13.3	0.06
184	30.205	31.970	0.16	0.17	2.28	84	-0.1	1.78	82	-3.5	99	0.090	96	96	4.6	-0.1	380	252	356	251	275	303	1508	314	85	58	86	58	80	-0.040	13.33	0.06

Wood Heater Test Data

7

Run: 4

Manufacturer: Hearth & Home
Model: Dauntless NC
Tracking No.: 2389
Project No.: 061WS104E
Test Date: 05-Oct-19
Beginning Clock Time: 12:41

Total Sampling Time: 586 min
Recording Interval: 1 min
Background Sample Volume: ____ cubic feet

Meter Box Y Factor: 0.992 (1) 0.989 (2) ____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	29.87		29.78	29.83 0

OMNI Equipment Numbers: ____

PM Control Modules: 371, 372
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.282 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 18.88 ft/sec.
Initial Tunnel Flow: 213.4 acfm
Average Tunnel Flow: 209.2 scfm
Post-Test Leak Check (1): 0.000 cfm @ 6 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ 10 in. Hg
Average Test Piece Fuel Moisture: 22.83 Dry Basis %

Technician Signature: ____

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.074	0.082	0.084	0.080	0.074	0.084	0.084	0.076	0.084	"H2O
Temp:	79	79	79	79	79	79	79	79	79	°F

V_{straw} 18.98 ft/sec V_{scent} 19.43 ft/sec F_p 0.977

	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst Exit	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
185	30.371	32.144	0.17	0.17	2.29	84	0.32	1.79	82	-3.5	98	0.080	102	102	4.6	0.0	381	252	357	252	275	303	1522	313	84	58	86	58	80	-0.040	13.34	0.04
186	30.537	32.317	0.17	0.17	2.30	84	0.16	1.78	82	-3.3	99	0.080	102	101	4.6	0.0	382	253	356	252	275	304	1534	313	84	58	86	58	80	-0.040	13.39	0.05
187	30.703	32.491	0.17	0.17	2.30	84	0.38	1.78	82	-3.2	99	0.080	102	102	4.5	-0.1	382	253	356	253	275	304	1535	314	84	58	85	58	80	-0.040	13.35	0.06
188	30.870	32.665	0.17	0.17	2.30	84	-0.02	1.79	82	-3.3	99	0.080	103	102	4.4	0.0	383	254	355	253	275	304	1543	315	84	58	85	58	80	-0.039	13.46	0.09
189	31.036	32.839	0.17	0.17	2.28	84	-0.06	1.79	82	-3.5	99	0.080	102	102	4.4	-0.1	383	254	355	253	275	304	1560	313	84	58	85	58	80	-0.039	13.49	0.09
190	31.202	33.012	0.17	0.17	2.29	84	0.08	1.78	82	-3.4	98	0.080	102	101	4.3	-0.1	384	255	355	253	275	304	1554	312	84	58	85	58	80	-0.040	13.47	0.08
191	31.368	33.186	0.17	0.17	2.29	84	0.38	1.78	82	-3.2	99	0.080	102	102	4.2	0.0	384	255	355	253	274	304	1531	311	83	58	85	58	80	-0.039	13.43	0.03
192	31.534	33.360	0.17	0.17	2.30	84	-0.07	1.80	82	-3.5	98	0.080	102	102	4.2	0.0	385	256	354	253	274	304	1536	311	83	58	85	58	80	-0.039	13.3	0.03
193	31.701	33.534	0.17	0.17	2.30	84	0.37	1.79	82	-3.5	99	0.080	103	102	4.1	-0.1	391	256	353	253	274	305	1514	313	83	58	85	58	80	-0.039	13.16	0.02
194	31.867	33.708	0.17	0.17	2.27	84	-0.12	1.78	82	-3.5	99	0.080	102	102	4.0	0.0	402	257	353	253	275	308	1511	312	83	58	85	58	80	-0.039	13.01	0.07
195	32.032	33.882	0.16	0.17	2.30	84	0.35	1.77	82	-3.5	99	0.080	102	102	4.0	0.0	409	259	353	253	275	310	1500	311	83	58	85	58	80	-0.040	12.94	0.02
196	32.198	34.055	0.17	0.17	2.30	84	0.13	1.79	82	-3.5	98	0.080	102	101	4.0	0.0	415	260	352	253	274	311	1501	308	83	58	85	58	80	-0.040	13.03	0.01
197	32.365	34.230	0.17	0.17	2.30	84	-0.07	1.79	82	-3.4	98	0.080	103	102	3.9	-0.1	419	261	351	251	274	311	1475	306	84	58	86	58	80	-0.038	12.96	0.01
198	32.531	34.403	0.17	0.17	2.30	84	0.43	1.77	82	-3.5	98	0.080	102	101	3.8	0.0	422	262	351	251	274	312	1432	301	84	58	86	58	80	-0.037	12.93	0.01
199	32.696	34.577	0.16	0.17	2.28	84	0.27	1.78	82	-3.5	98	0.080	101	102	3.8	0.0	424	264	350	250	274	312	1402	296	84	58	86	58	80	-0.037	12.31	0
200	32.862	34.751	0.17	0.17	2.29	84	-0.13	1.79	82	-3.4	97	0.090	96	96	3.8	0.0	424	265	349	248	274	312	1363	289	84	58	86	58	80	-0.036	11.41	0
201	33.027	34.924	0.16	0.17	2.29	84	-0.06	1.78	82	-3.4	97	0.080	101	101	3.7	-0.1	422	266	348	246	274	311	1317	281	85	58	86	58	80	-0.035	10.69	0
202	33.194	35.098	0.17	0.17	2.28	84	-0.02	1.78	82	-3.5	96	0.080	103	101	3.7	0.0	420	267	347	244	274	310	1284	274	85	58	86	58	80	-0.034	10.02	0
203	33.360	35.272	0.17	0.17	2.27	84	-0.03	1.78	82	-3.3	96	0.080	102	101	3.7	0.0	416	268	346	242	274	309	1262	268	85	58	86	59	80	-0.033	9.41	0.01
204	33.525	35.446	0.16	0.17	2.28	84	0.42	1.79	82	-3.5	96	0.080	101	101	3.7	0.0	411	269	344	238	274	307	1237	263	85	58	85	59	80	-0.032	8.89	0.01
205	33.691	35.620	0.17	0.17	2.29	84	-0.08	1.78	82	-3.5	96	0.080	102	101	3.7	0.0	407	269	342	236	274	306	1210	258	85	58	85	59	80	-0.032	8.63	0.02
206	33.857	35.794	0.17	0.17	2.27	84	0.19	1.78	82	-3.3	95	0.080	102	101	3.7	0.0	404	269	341	233	274	304	1201	254	85	58	85	59	80	-0.031	8.3	0.03
207	34.023	35.967	0.17	0.17	2.28	84	-0.11	1.79	82	-3.5	95	0.080	102	101	3.7	0.0	400	269	340	230	274	303	1185	250	85	59	85	59	80	-0.030	8.01	0.04
208	34.188	36.142	0.16	0.18	2.28	84	0.34	1.79	82	-3.5	95	0.080	101	102	3.6	0.0	397	269	338	227	274	301	1149	246	84	59	85	59	80	-0.030	7.89	0.05
209	34.354	36.316	0.17	0.17	2.29	84	-0.04	1.78	82	-3.5	95	0.080	102	101	3.6	0.0	395	270	337	224	274	300	1119	244	84	59	85	59	80	-0.029	7.66	0.07
210	34.520	36.490	0.17	0.17	2.29	84	0.07	1.77	82	-3.5	94	0.090	96	95	3.6	0.0	392	269	335	222	274	298	1097	242	84	59	85	59	80	-0.029	7.54	0.09
211	34.687	36.663	0.17	0.17	2.28	84	0.27	1.79	82	-3.5	94	0.080	102	101	3.5	-0.1	390	269	334	219	273	297	1084	239	84	59	85	59	80	-0.028	7.38	0.1
212	34.852	36.837	0.16	0.17	2.26	84	0.21	1.79	82	-3.5	94	0.080	101	101	3.5	0.0	388	269	333	216	274	296	1068	236	84	59	85	59	80	-0.028	7.32	0.09
213	35.017	37.011	0.17	0.17	2.29	84	0.39	1.79	82	-3.2	94	0.080	101	101	3.5	0.0	386	269	331	213	274	295	1055	233	84	59	85	59	80	-0.027	7.23	0.09
214	35.183	37.185	0.17	0.17	2.29	84	-0.07	1.79	82	-3.3	94	0.090	96	95	3.5	0.0	383	269	330	211	273	293	1039	232	83	59	85	59	79	-0.027	7.08	0.09
215	35.350	37.360	0.17	0.17	2.29	84	0.07	1.79	82	-3.5	94	0.080	102	102	3.5	0.0	381	269	328	208	274	292	1027	230	83	59	85	59	80	-0.027	7.06	0.09
216	35.515	37.534	0.16	0.17	2.28	84	0.19	1.78	82	-3.3	93	0.080	101	101	3.5	0.0	378	269	326	205	273	290	1014	228	83	59	86	59	80	-0.026	7	0.09
217	35.681	37.708	0.17	0.17	2.29	84	0.07	1.79	82	-3.5	93	0.080	102	101	3.5	0.0	376	268	325	203	273	289	997	226	83	59	86	59	80	-0.026	6.84	0.11
218	35.847	37.882	0.17	0.17	2.29	84	-0.12	1.79	82	-3.3	93	0.080	102	101	3.5	0.0	374	268	323	201	273	288	983	223	83	59	85	59	79	-0.025	6.7	0.2
219	36.012	38.056	0.16	0.17	2.29	84	0.15	1.79	82	-3.5	93	0.090	95	95	3.5	0.0	372	268	321	199	272	286	970	220	83	59	85	59	79	-0.025	6.51	0.2
220	36.179	38.230	0.17	0.17	2.28	84	0.43	1.79	82	-3.3	93	0.080	102	101	3.5	0.0	370	268	321	196	272	285	955	219	83	59	85	59	79	-0.024	6.48	0.18
221	36.344	38.404	0.16	0.17	2.27	84	-0.13	1.78	82	-3.3	93	0.080	101	101	3.5	0.0	368	267	319	194	272	284	944	217	83	59	85	59	79	-0.024	6.42	0.17

Wood Heater Test Data

7

Run: 4

Manufacturer: Hearth & Home
Model: Dauntless NC
Tracking No.: 2389
Project No.: 061WS104E
Test Date: 05-Oct-19
Beginning Clock Time: 12:41

Total Sampling Time: 586 min
Recording Interval: 1 min
Background Sample Volume: _____ cubic feet

Meter Box Y Factor: 0.992 (1) 0.989 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	29.87		29.78	29.83 0

OMNI Equipment Numbers: _____

PM Control Modules: 371, 372
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.282 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 18.88 ft/sec.
Initial Tunnel Flow: 213.4 acfm
Average Tunnel Flow: 209.2 scfm
Post-Test Leak Check (1): 0.000 cfm @ 6 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ 10 in. Hg
Average Test Piece Fuel Moisture: 22.83 Dry Basis %

Technician Signature: _____

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.074	0.082	0.084	0.080	0.074	0.084	0.084	0.076	0.084	"H2O
Temp:	79	79	79	79	79	79	79	79	79	°F

V_{straw} 18.98 ft/sec V_{scent} 19.43 ft/sec F_p 0.977

	Particulate Sampling Data													Fuel Weight (lb)		Temperature Data (°F)											Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst Exit	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
222	36.510	38.578	0.17	0.17	2.28	83	0.32	1.79	82	-3.2	92	0.080	102	101	3.5	0.0	366	267	318	192	273	283	943	216	83	59	85	59	79	-0.023	6.38	0.17
223	36.676	38.752	0.17	0.17	2.29	83	0.07	1.78	82	-3.3	92	0.080	102	101	3.5	0.0	365	267	316	190	272	282	927	214	84	59	85	59	79	-0.023	6.32	0.17
224	36.842	38.926	0.17	0.17	2.27	83	0.29	1.78	82	-3.4	92	0.080	102	101	3.4	0.0	363	267	315	188	272	281	918	212	84	59	85	59	79	-0.023	6.2	0.22
225	37.008	39.100	0.17	0.17	2.28	83	-0.12	1.79	82	-3.4	92	0.080	102	101	3.4	0.0	361	266	313	186	272	280	908	210	84	59	85	59	79	-0.022	6.19	0.19
226	37.173	39.274	0.16	0.17	2.28	83	0.39	1.79	82	-3.5	92	0.080	101	101	3.4	0.0	360	266	312	184	271	279	900	209	84	59	85	59	79	-0.022	6.14	0.18
227	37.339	39.449	0.17	0.17	2.29	83	0.35	1.79	82	-3.2	91	0.080	102	101	3.4	0.0	358	265	310	182	271	277	892	207	84	59	85	59	79	-0.022	6.16	0.18
228	37.504	39.623	0.16	0.17	2.29	83	-0.09	1.79	82	-3.5	91	0.090	95	95	3.3	-0.1	357	265	309	181	270	276	883	206	84	59	85	59	79	-0.021	6.14	0.18
229	37.671	39.797	0.17	0.17	2.28	83	0.41	1.79	82	-3.3	91	0.090	96	95	3.3	0.0	356	265	308	179	270	276	877	204	84	59	85	59	79	-0.021	6.12	0.18
230	37.836	39.971	0.16	0.17	2.26	83	-0.12	1.79	82	-3.4	91	0.080	101	101	3.3	0.0	354	264	307	177	270	274	870	203	84	59	85	59	79	-0.021	6.07	0.2
231	38.002	40.146	0.17	0.18	2.29	83	0.23	1.78	82	-3.5	91	0.080	102	101	3.3	0.0	353	264	305	176	270	274	861	202	84	59	85	59	79	-0.020	6.03	0.22
232	38.167	40.319	0.16	0.17	2.28	83	0.29	1.79	82	-3.4	91	0.080	101	100	3.3	0.0	352	264	304	175	270	273	853	200	84	59	85	59	79	-0.020	5.97	0.24
233	38.334	40.494	0.17	0.17	2.26	83	0.01	1.79	82	-3.2	91	0.080	102	101	3.3	0.0	351	263	302	173	269	272	844	199	84	59	85	59	79	-0.020	5.94	0.26
234	38.500	40.668	0.17	0.17	2.27	83	0.36	1.78	82	-3.5	90	0.080	102	101	3.3	0.0	349	263	301	172	269	271	832	197	83	59	85	59	78	-0.020	5.87	0.27
235	38.665	40.842	0.16	0.17	2.27	83	0.17	1.79	82	-3.4	90	0.080	101	101	3.3	0.0	348	262	300	170	269	270	824	197	83	59	85	60	79	-0.019	5.8	0.3
236	38.830	41.016	0.16	0.17	2.29	83	-0.03	1.79	82	-3.5	90	0.080	101	101	3.3	0.0	347	262	299	169	268	269	816	197	83	59	85	60	79	-0.019	5.74	0.34
237	38.996	41.190	0.17	0.17	2.30	83	0.28	1.78	82	-3.5	90	0.090	96	95	3.3	0.0	346	261	297	168	268	268	810	196	83	59	85	60	79	-0.019	5.7	0.35
238	39.162	41.365	0.17	0.18	2.27	83	0	1.77	82	-3.2	90	0.080	102	101	3.3	0.0	345	261	297	166	267	267	803	195	83	59	85	60	78	-0.019	5.7	0.38
239	39.327	41.539	0.16	0.17	2.28	83	-0.13	1.79	82	-3.5	90	0.080	101	101	3.3	0.0	344	260	295	164	267	266	795	194	83	59	85	60	78	-0.019	5.66	0.4
240	39.493	41.713	0.17	0.17	2.28	83	0.07	1.79	82	-3.2	90	0.080	102	101	3.3	0.0	343	260	293	164	266	265	788	193	83	59	85	60	79	-0.019	5.64	0.42
241	39.659	41.887	0.17	0.17	2.29	83	-0.01	1.78	82	-3.4	90	0.090	96	95	3.3	0.0	342	259	292	163	266	264	781	191	83	59	85	60	79	-0.018	5.63	0.44
242	39.826	42.061	0.17	0.17	2.28	83	0.01	1.80	82	-3.3	90	0.080	102	101	3.3	0.0	341	259	291	163	265	264	774	190	83	59	85	60	79	-0.018	5.61	0.45
243	39.991	42.236	0.16	0.17	2.26	83	0.43	1.79	82	-3.4	89	0.080	101	101	3.3	0.0	340	258	290	162	264	263	764	190	83	59	85	60	79	-0.018	5.56	0.47
244	40.156	42.410	0.16	0.17	2.28	83	-0.11	1.78	82	-3.4	89	0.080	101	101	3.3	0.0	339	258	289	161	264	262	752	188	83	59	85	60	79	-0.018	5.54	0.48
245	40.322	42.584	0.17	0.17	2.29	83	0.37	1.78	82	-3.5	89	0.080	101	101	3.3	0.0	338	257	288	160	264	261	745	187	84	59	85	60	79	-0.018	5.52	0.53
246	40.488	42.758	0.17	0.17	2.26	83	-0.12	1.80	82	-3.3	89	0.080	101	101	3.2	0.0	337	257	287	159	264	261	740	186	84	59	85	60	78	-0.017	5.5	0.55
247	40.653	42.932	0.16	0.17	2.27	83	0.26	1.78	82	-3.2	89	0.080	101	101	3.2	0.0	336	256	286	158	263	260	737	185	84	59	85	60	78	-0.017	5.46	0.55
248	40.819	43.107	0.17	0.17	2.27	83	0.43	1.79	82	-3.3	89	0.080	101	101	3.2	0.0	335	255	284	157	263	259	735	185	84	59	85	60	78	-0.017	5.47	0.57
249	40.984	43.281	0.16	0.17	2.28	83	0.41	1.80	82	-3.3	88	0.080	101	101	3.2	0.0	334	255	284	156	262	258	727	184	84	60	85	60	78	-0.017	5.56	0.58
250	41.150	43.455	0.17	0.17	2.29	83	-0.1	1.79	82	-3.2	88	0.080	101	101	3.2	0.0	333	254	282	155	262	257	722	183	84	59	85	60	78	-0.017	5.58	0.59
251	41.316	43.629	0.17	0.17	2.29	83	0.38	1.78	82	-3.3	88	0.090	96	95	3.1	-0.1	333	254	281	154	261	257	716	183	84	60	85	60	78	-0.017	5.56	0.59
252	41.481	43.804	0.16	0.18	2.27	83	-0.13	1.79	82	-3.5	88	0.080	101	101	3.1	0.0	332	253	280	153	260	256	713	182	84	60	85	60	78	-0.016	5.52	0.58
253	41.646	43.978	0.16	0.17	2.28	83	0.09	1.79	82	-3.5	88	0.080	101	101	3.1	0.0	331	252	279	152	260	255	708	181	84	60	85	60	78	-0.016	5.54	0.57
254	41.812	44.152	0.17	0.17	2.28	83	0.42	1.79	82	-3.3	88	0.080	101	101	3.1	0.0	331	252	278	151	260	254	702	180	83	60	85	60	78	-0.016	5.57	0.58
255	41.978	44.326	0.17	0.17	2.26	83	0.03	1.79	82	-3.3	88	0.090	96	95	3.1	0.0	330	251	277	151	259	254	697	179	83	60	85	60	78	-0.016	5.55	0.58
256	42.144	44.500	0.17	0.17	2.27	83	-0.06	1.80	82	-3.3	88	0.080	101	101	3.1	0.0	329	251	276	150	259	253	694	179	83	60	85	60	78	-0.015	5.51	0.59
257	42.309	44.675	0.16	0.17	2.27	83	-0.09	1.79	82	-3.5	88	0.080	101	101	3.1	0.0	328	250	275	149	258	252	691	179	83	60	85	60	78	-0.015	5.51	0.6
258	42.475	44.849	0.17	0.17	2.27	83	-0.1	1.79	82	-3.3	87	0.080	101	101	3.1	0.0	328	250	274	148	258	252	687	178	83	60	85	60	78	-0.015	5.52	0.6

Wood Heater Test Data

7

Run: 4

Manufacturer: Hearth & Home
Model: Dauntless NC
Tracking No.: 2389
Project No.: 061WS104E
Test Date: 05-Oct-19
Beginning Clock Time: 12:41

Total Sampling Time: 586 min
Recording Interval: 1 min
Background Sample Volume: ____ cubic feet

Meter Box Y Factor: 0.992 (1) 0.989 (2) ____ (Amb)

Barometric Pressure: Begin 29.87 Middle ____ End 29.78 Average 29.83 0

OMNI Equipment Numbers: ____

PM Control Modules: 371, 372
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.282 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 18.88 ft/sec.
Initial Tunnel Flow: 213.4 acfm
Average Tunnel Flow: 209.2 scfm
Post-Test Leak Check (1): 0.000 cfm @ 6 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ 10 in. Hg
Average Test Piece Fuel Moisture: 22.83 Dry Basis %

Technician Signature: ____

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.074	0.082	0.084	0.080	0.074	0.084	0.084	0.076	0.084	"H2O
Temp:	79	79	79	79	79	79	79	79	79	°F

V_{straw} 18.98 ft/sec V_{scent} 19.43 ft/sec F_p 0.977

	Particulate Sampling Data													Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst Exit	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
259	42.641	45.024	0.17	0.18	2.29	83	0.41	1.79	82	-3.3	88	0.080	101	101	3.1	0.0	327	249	273	148	257	251	682	178	83	60	85	60	78	-0.015	5.52	0.6
260	42.806	45.198	0.16	0.17	2.26	83	-0.11	1.80	82	-3.4	87	0.090	95	95	3.1	0.0	326	248	272	147	257	250	678	177	82	60	85	60	78	-0.015	5.48	0.59
261	42.971	45.372	0.16	0.17	2.28	83	-0.06	1.79	82	-3.5	87	0.080	101	101	3.1	0.0	325	248	272	146	256	249	676	177	83	60	85	60	77	-0.015	5.52	0.59
262	43.137	45.546	0.17	0.17	2.28	83	0.39	1.79	82	-3.5	87	0.080	101	101	3.1	0.0	326	247	271	145	255	249	674	177	83	60	85	60	78	-0.015	5.52	0.59
263	43.303	45.720	0.17	0.17	2.27	83	0.01	1.80	82	-3.5	87	0.080	101	101	3.1	0.0	324	247	270	144	255	248	670	176	83	60	85	60	77	-0.015	5.52	0.59
264	43.468	45.895	0.17	0.18	2.28	83	-0.08	1.79	82	-3.5	87	0.080	101	101	3.1	0.0	323	246	268	144	254	247	667	177	83	60	85	60	78	-0.015	5.55	0.6
265	43.634	46.069	0.17	0.17	2.26	83	0.27	1.79	82	-3.5	87	0.090	95	95	3.1	0.0	323	246	268	143	253	247	663	176	83	60	85	60	78	-0.015	5.58	0.6
266	43.799	46.243	0.16	0.17	2.27	83	0.41	1.78	82	-3.4	87	0.080	101	101	3.1	0.0	322	246	266	143	253	246	660	175	83	60	85	60	78	-0.015	5.57	0.6
267	43.964	46.417	0.16	0.17	2.29	83	-0.13	1.79	82	-3.2	87	0.090	95	95	3.1	0.0	322	245	266	142	252	245	658	174	84	60	85	61	78	-0.015	5.58	0.59
268	44.131	46.591	0.17	0.17	2.29	83	-0.13	1.79	82	-3.5	86	0.080	102	100	3.1	0.0	322	245	265	142	252	245	655	174	84	60	85	61	78	-0.015	5.55	0.59
269	44.296	46.766	0.16	0.17	2.26	83	0.13	1.79	82	-3.3	86	0.080	101	101	3.0	-0.1	321	244	264	142	251	244	652	174	84	60	85	61	78	-0.014	5.56	0.59
270	44.461	46.940	0.16	0.17	2.28	83	0.41	1.80	82	-3.5	86	0.080	101	100	3.0	0.0	321	244	264	141	251	244	649	174	84	60	85	61	78	-0.014	5.56	0.6
271	44.627	47.115	0.17	0.18	2.28	83	0.05	1.79	82	-3.5	86	0.080	101	101	3.0	0.0	321	244	263	141	250	244	646	173	84	60	85	61	78	-0.014	5.57	0.6
272	44.793	47.289	0.17	0.17	2.26	83	0.41	1.78	82	-3.3	86	0.080	101	100	3.0	0.0	320	243	262	140	250	243	643	173	83	60	85	61	77	-0.014	5.6	0.61
273	44.958	47.463	0.16	0.17	2.27	83	-0.04	1.78	82	-3.3	86	0.080	101	100	3.0	0.0	320	243	261	140	249	243	640	172	83	60	85	61	78	-0.014	5.59	0.6
274	45.123	47.637	0.16	0.17	2.27	83	-0.02	1.80	82	-3.5	86	0.080	101	100	3.0	0.0	320	243	260	139	248	242	637	172	83	60	85	61	78	-0.014	5.57	0.6
275	45.289	47.811	0.17	0.17	2.28	83	0.33	1.79	82	-3.2	86	0.080	101	100	2.9	0.0	320	242	260	139	248	242	633	171	83	60	85	61	77	-0.014	5.55	0.6
276	45.455	47.986	0.17	0.17	2.29	83	0.36	1.79	82	-3.5	86	0.080	101	101	2.9	0.0	319	242	259	138	247	241	631	171	83	60	85	61	77	-0.013	5.57	0.6
277	45.620	48.160	0.16	0.17	2.26	83	0.42	1.79	82	-3.3	86	0.080	101	100	2.9	0.0	319	242	258	137	247	241	629	170	83	60	85	61	78	-0.014	5.53	0.6
278	45.786	48.334	0.17	0.17	2.28	83	-0.13	1.79	82	-3.5	86	0.080	101	100	2.9	0.0	319	241	258	137	246	240	625	170	82	60	85	61	76	-0.013	5.54	0.6
279	45.951	48.508	0.16	0.17	2.28	83	0.34	1.78	82	-3.2	86	0.080	101	100	2.9	0.0	318	241	257	136	246	240	623	170	82	60	85	61	76	-0.013	5.55	0.6
280	46.117	48.683	0.17	0.17	2.28	83	0.25	1.79	82	-3.2	86	0.090	95	95	2.9	0.0	318	241	256	135	245	239	621	169	82	60	85	61	77	-0.013	5.52	0.59
281	46.282	48.857	0.16	0.17	2.27	83	-0.08	1.79	81	-3.5	86	0.080	101	101	2.9	0.0	317	241	255	135	244	238	617	169	82	60	85	61	78	-0.013	5.48	0.59
282	46.448	49.031	0.17	0.17	2.27	83	0.07	1.79	81	-3.5	86	0.080	101	101	2.9	0.0	317	241	255	135	244	238	614	168	83	60	85	61	77	-0.013	5.5	0.59
283	46.613	49.206	0.16	0.18	2.27	83	0.41	1.78	81	-3.3	85	0.080	100	101	2.9	0.0	317	240	254	134	243	238	612	167	83	60	85	61	77	-0.013	5.5	0.59
284	46.779	49.380	0.17	0.17	2.29	83	0.27	1.80	81	-3.5	85	0.080	101	101	2.9	0.0	316	240	253	134	243	237	610	168	83	60	85	61	77	-0.013	5.51	0.59
285	46.945	49.554	0.17	0.17	2.28	83	-0.07	1.79	81	-3.4	85	0.080	101	101	2.9	0.0	316	240	252	133	243	237	608	167	83	60	85	61	76	-0.013	5.48	0.59
286	47.110	49.729	0.16	0.17	2.26	83	0.11	1.79	81	-3.5	85	0.090	95	95	2.9	0.0	316	239	252	132	242	236	607	168	83	60	85	61	75	-0.013	5.48	0.59
287	47.276	49.903	0.17	0.17	2.28	83	-0.08	1.81	81	-3.5	85	0.080	101	101	2.9	0.0	316	239	251	131	242	236	606	168	83	60	85	61	75	-0.013	5.56	0.64
288	47.442	50.078	0.17	0.18	2.29	82	0.35	1.79	81	-3.3	84	0.080	101	101	2.9	0.0	317	239	250	131	241	236	603	168	83	60	85	61	75	-0.013	5.58	0.7
289	47.608	50.252	0.17	0.17	2.29	82	0.35	1.79	81	-3.5	84	0.080	101	100	2.9	0.0	317	239	250	130	241	235	601	167	83	60	85	61	74	-0.013	5.61	0.69
290	47.774	50.427	0.17	0.17	2.29	82	-0.07	1.81	81	-3.3	84	0.080	101	101	2.9	0.0	318	239	249	129	240	235	599	168	83	61	85	61	74	-0.013	5.64	0.67
291	47.940	50.602	0.17	0.17	2.29	82	-0.09	1.80	81	-3.3	84	0.080	101	101	2.9	0.0	318	238	248	129	240	235	597	167	83	61	85	61	74	-0.013	5.63	0.66
292	48.105	50.776	0.16	0.17	2.30	82	0.4	1.80	81	-3.2	84	0.080	101	100	2.9	0.0	318	238	248	129	239	234	593	167	83	61	85	61	74	-0.013	5.62	0.65
293	48.271	50.951	0.17	0.17	2.30	82	0.03	1.80	81	-3.3	84	0.080	101	101	2.8	-0.1	319	238	247	128	238	234	590	165	83	61	85	61	74	-0.013	5.62	0.65
294	48.439	51.126	0.17	0.17	2.28	82	0.19	1.80	81	-3.4	83	0.080	102	101	2.8	0.0	319	238	246	128	238	234	589	166	82	61	85	61	74	-0.013	5.64	0.66
295	48.604	51.300	0.16	0.17	2.28	82	0.34	1.80	81	-3.3	83	0.080	100	100	2.8	0.0	319	237	246	127	237	233	586	165	82	61	85	61	74	-0.012	5.64	0.67

Wood Heater Test Data

7

Run: 4

Manufacturer: Hearth & Home
Model: Dauntless NC
Tracking No.: 2389
Project No.: 061WS104E
Test Date: 05-Oct-19
Beginning Clock Time: 12:41

Total Sampling Time: 586 min
Recording Interval: 1 min
Background Sample Volume: ____ cubic feet

Meter Box Y Factor: 0.992 (1) 0.989 (2) ____ (Amb)

Barometric Pressure: Begin 29.87 Middle ____ End 29.78 Average 29.83 0

OMNI Equipment Numbers: ____

PM Control Modules: 371, 372
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.282 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 18.88 ft/sec.
Initial Tunnel Flow: 213.4 acfm
Average Tunnel Flow: 209.2 scfm
Post-Test Leak Check (1): 0.000 cfm @ 6 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ 10 in. Hg
Average Test Piece Fuel Moisture: 22.83 Dry Basis %

Technician Signature: 

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.074	0.082	0.084	0.080	0.074	0.084	0.084	0.076	0.084	"H2O
Temp:	79	79	79	79	79	79	79	79	79	°F

V_{straw} 18.98 ft/sec V_{scent} 19.43 ft/sec F_p 0.977

	Particulate Sampling Data													Fuel Weight (lb)		Temperature Data (°F)													Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst Exit	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
296	48.770	51.475	0.17	0.18	2.30	82	-0.07	1.80	81	-3.5	83	0.080	101	101	2.8	0.0	319	237	245	127	237	233	583	165	82	61	84	61	74	-0.012	5.61	0.68
297	48.936	51.650	0.17	0.17	2.30	82	0.01	1.81	81	-3.4	83	0.080	101	101	2.8	0.0	318	237	245	126	236	232	581	164	82	61	85	61	74	-0.012	5.61	0.68
298	49.102	51.825	0.17	0.18	2.30	82	-0.13	1.80	81	-3.5	83	0.080	101	101	2.7	0.0	319	237	244	126	236	232	580	164	82	61	85	61	74	-0.012	5.61	0.67
299	49.269	52.000	0.17	0.17	2.30	82	0.35	1.80	81	-3.4	83	0.090	96	95	2.7	0.0	319	237	244	125	235	232	576	164	82	61	85	61	73	-0.012	5.61	0.66
300	49.435	52.174	0.17	0.17	2.28	82	-0.09	1.81	81	-3.3	83	0.080	101	100	2.7	0.0	319	237	243	125	235	232	573	163	82	61	85	61	74	-0.012	5.64	0.66
301	49.601	52.350	0.18	0.18	2.30	82	0.28	1.80	81	-3.5	82	0.090	95	96	2.7	0.0	318	236	242	125	234	231	570	163	82	61	85	61	73	-0.012	5.6	0.65
302	49.768	52.524	0.17	0.17	2.30	81	0.43	1.80	81	-3.4	82	0.090	96	95	2.7	0.0	318	236	242	124	233	231	569	162	83	61	85	61	73	-0.012	5.59	0.64
303	49.934	52.699	0.17	0.17	2.31	81	0.32	1.79	81	-3.3	82	0.080	101	101	2.7	0.0	318	236	242	124	232	230	566	162	83	61	85	61	73	-0.012	5.56	0.63
304	50.100	52.874	0.17	0.18	2.31	81	0.29	1.81	81	-3.5	82	0.080	101	101	2.7	0.0	318	236	241	123	232	230	564	161	83	61	85	61	73	-0.012	5.54	0.63
305	50.266	53.049	0.17	0.17	2.29	81	0.09	1.80	80	-3.2	82	0.090	95	95	2.7	0.0	318	236	240	123	231	230	563	161	83	61	85	61	72	-0.011	5.55	0.63
306	50.432	53.224	0.17	0.17	2.29	81	-0.03	1.80	80	-3.4	82	0.090	95	95	2.7	0.0	318	236	240	123	231	230	558	160	83	61	85	61	73	-0.011	5.56	0.62
307	50.599	53.398	0.17	0.17	2.29	81	0.4	1.81	80	-3.3	82	0.080	102	100	2.7	0.0	318	235	239	122	230	229	557	160	83	61	85	61	73	-0.011	5.52	0.61
308	50.765	53.573	0.17	0.17	2.30	81	0	1.79	80	-3.3	82	0.080	101	101	2.7	0.0	317	235	239	122	230	229	554	160	83	61	84	61	73	-0.011	5.51	0.61
309	50.931	53.748	0.17	0.17	2.29	81	0.41	1.80	80	-3.2	82	0.080	101	101	2.7	0.0	317	235	239	122	229	228	552	159	83	61	84	61	73	-0.011	5.52	0.6
310	51.097	53.923	0.17	0.18	2.29	81	0	1.81	80	-3.2	81	0.080	101	101	2.7	0.0	316	235	238	122	229	228	548	159	82	61	84	61	72	-0.011	5.52	0.6
311	51.263	54.097	0.17	0.17	2.29	81	0.3	1.81	80	-3.4	81	0.080	101	100	2.7	0.0	316	235	238	121	228	228	546	159	82	61	85	62	72	-0.011	5.49	0.59
312	51.429	54.273	0.17	0.18	2.30	81	0.41	1.80	80	-3.4	81	0.080	101	102	2.7	0.0	316	235	237	121	227	227	543	158	82	61	85	62	72	-0.011	5.49	0.59
313	51.596	54.447	0.17	0.17	2.29	81	0.04	1.81	80	-3.5	81	0.090	96	95	2.7	0.0	316	235	237	120	227	227	542	157	82	61	85	62	72	-0.011	5.47	0.59
314	51.762	54.622	0.17	0.17	2.29	81	0.19	1.81	80	-3.5	81	0.080	101	101	2.7	0.0	316	235	236	120	226	227	540	157	82	61	85	61	72	-0.011	5.45	0.58
315	51.928	54.797	0.17	0.17	2.30	81	-0.11	1.80	80	-3.4	81	0.080	101	101	2.7	0.0	316	235	236	120	225	226	537	157	82	61	85	62	72	-0.010	5.5	0.59
316	52.094	54.971	0.17	0.17	2.30	81	-0.12	1.82	80	-3.2	81	0.080	101	100	2.7	0.0	315	234	235	119	225	226	535	157	82	61	85	62	72	-0.010	5.47	0.59
317	52.260	55.147	0.17	0.18	2.31	81	0.23	1.81	80	-3.4	81	0.080	101	102	2.7	0.0	315	234	235	119	224	225	532	156	82	61	85	62	72	-0.010	5.47	0.59
318	52.427	55.321	0.17	0.17	2.28	80	-0.08	1.79	80	-3.2	81	0.080	102	100	2.6	-0.1	314	234	235	119	224	225	532	156	82	61	85	62	72	-0.011	5.46	0.59
319	52.593	55.496	0.17	0.18	2.29	80	0.42	1.82	80	-3.3	81	0.090	95	95	2.6	0.0	314	234	235	118	223	225	530	156	83	61	84	62	72	-0.010	5.46	0.59
320	52.759	55.671	0.17	0.17	2.29	80	-0.13	1.81	80	-3.2	81	0.090	95	95	2.6	0.0	314	234	234	118	222	224	529	156	83	61	84	62	72	-0.010	5.46	0.59
321	52.924	55.846	0.16	0.17	2.30	80	0.43	1.80	80	-3.3	80	0.090	95	95	2.6	0.0	314	234	233	118	222	224	528	156	83	61	84	62	73	-0.010	5.45	0.58
322	53.090	56.021	0.17	0.18	2.31	80	-0.13	1.80	79	-3.4	80	0.080	101	101	2.6	0.0	314	233	233	118	221	224	529	155	83	61	84	62	72	-0.010	5.41	0.58
323	53.257	56.195	0.17	0.17	2.29	80	-0.03	1.81	79	-3.5	80	0.080	102	100	2.6	0.0	314	233	233	117	221	224	530	156	83	61	84	62	72	-0.010	5.44	0.59
324	53.423	56.370	0.17	0.17	2.29	80	-0.12	1.81	79	-3.3	80	0.080	101	101	2.5	0.0	314	233	232	117	220	223	528	155	83	61	85	62	71	-0.010	5.46	0.59
325	53.589	56.545	0.17	0.18	2.29	80	0.36	1.80	79	-3.2	80	0.080	101	101	2.5	0.0	314	233	232	117	219	223	527	154	82	61	85	62	71	-0.010	5.46	0.6
326	53.755	56.720	0.17	0.17	2.30	80	0.18	1.81	79	-3.3	80	0.080	101	101	2.5	0.0	313	233	232	116	219	223	525	155	82	61	85	62	71	-0.010	5.44	0.6
327	53.921	56.894	0.17	0.17	2.28	80	0.2	1.80	79	-3.5	80	0.080	101	100	2.5	0.0	313	232	231	116	218	222	524	154	82	61	85	62	71	-0.010	5.45	0.6
328	54.087	57.070	0.17	0.18	2.30	80	-0.05	1.80	79	-3.2	80	0.080	101	102	2.5	0.0	313	232	231	116	217	222	524	154	82	61	85	62	72	-0.010	5.48	0.61
329	54.253	57.244	0.17	0.17	2.29	80	0.38	1.82	79	-3.3	80	0.090	95	95	2.5	0.0	313	232	231	115	217	222	521	154	82	61	85	62	71	-0.010	5.47	0.61
330	54.419	57.419	0.17	0.17	2.30	80	0.43	1.80	79	-3.5	80	0.080	101	101	2.5	0.0	312	232	230	115	216	221	519	154	82	61	85	62	72	-0.010	5.47	0.61
331	54.585	57.594	0.17	0.18	2.31	80	0.07	1.80	79	-3.3	80	0.080	101	101	2.5	0.0	312	231	230	115	216	221	519	153	82	61	84	62	71	-0.010	5.46	0.61
332	54.752	57.769	0.17	0.17	2.28	79	0.02	1.82	79	-3.2	80	0.090	96	95	2.5	0.0	312	231	230	115	215	221	518	154	82	61	84	62	71	-0.010	5.46	0.61

Wood Heater Test Data

7

Run: 4

Manufacturer: Hearth & Home
Model: Dauntless NC
Tracking No.: 2389
Project No.: 061WS104E
Test Date: 05-Oct-19
Beginning Clock Time: 12:41

Total Sampling Time: 586 min
Recording Interval: 1 min
Background Sample Volume: _____ cubic feet

Meter Box Y Factor: 0.992 (1) 0.989 (2) _____ (Amb)

Barometric Pressure: Begin 29.87 Middle _____ End 29.78 Average 29.83 0

OMNI Equipment Numbers: _____

PM Control Modules: 371, 372
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.282 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 18.88 ft/sec.
Initial Tunnel Flow: 213.4 acfm
Average Tunnel Flow: 209.2 scfm
Post-Test Leak Check (1): 0.000 cfm @ 6 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ 10 in. Hg
Average Test Piece Fuel Moisture: 22.83 Dry Basis %

Technician Signature: _____

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.074	0.082	0.084	0.080	0.074	0.084	0.084	0.076	0.084	"H2O
Temp:	79	79	79	79	79	79	79	79	79	°F

V_{straw} 18.98 ft/sec V_{scent} 19.43 ft/sec F_p 0.977

	Particulate Sampling Data													Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst Exit	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
333	54.917	57.944	0.16	0.18	2.29	79	-0.12	1.80	79	-3.2	80	0.080	101	101	2.5	0.0	312	231	229	114	215	220	515	153	82	61	84	62	71	-0.010	5.46	0.61
334	55.083	58.118	0.17	0.17	2.29	79	0.23	1.81	79	-3.3	79	0.090	95	95	2.5	0.0	311	231	229	114	215	220	513	153	82	61	84	62	71	-0.010	5.46	0.61
335	55.249	58.293	0.17	0.17	2.30	79	0.43	1.80	79	-3.3	80	0.080	101	101	2.5	0.0	311	231	229	114	214	220	514	153	83	61	84	62	71	-0.010	5.44	0.61
336	55.415	58.468	0.17	0.18	2.31	79	0.08	1.81	79	-3.2	80	0.080	101	101	2.4	-0.1	310	230	228	114	213	219	511	152	83	61	85	62	72	-0.009	5.47	0.61
337	55.581	58.642	0.17	0.17	2.29	79	0.05	1.80	79	-3.3	80	0.080	101	100	2.4	0.0	310	230	228	114	213	219	507	152	83	61	85	62	73	-0.009	5.47	0.62
338	55.746	58.817	0.16	0.17	2.28	79	0.22	1.80	78	-3.3	80	0.080	101	101	2.4	0.0	309	230	228	114	212	219	505	152	83	61	85	62	73	-0.009	5.47	0.67
339	55.912	58.992	0.17	0.17	2.30	79	-0.02	1.81	78	-3.4	80	0.080	101	101	2.4	0.0	309	230	228	114	211	218	504	151	82	61	85	62	73	-0.009	5.46	0.73
340	56.077	59.166	0.16	0.17	2.30	79	-0.11	1.80	78	-3.3	80	0.080	101	101	2.4	0.0	308	230	228	114	210	218	503	151	82	61	85	62	73	-0.009	5.48	0.76
341	56.244	59.341	0.17	0.18	2.30	79	0.34	1.80	78	-3.2	80	0.080	102	101	2.4	0.0	308	230	228	115	210	218	501	151	82	61	85	62	73	-0.009	5.47	0.76
342	56.409	59.515	0.16	0.17	2.27	79	0.24	1.81	78	-3.4	80	0.080	101	101	2.4	0.0	307	229	227	114	209	217	499	151	82	61	85	62	73	-0.009	5.49	0.77
343	56.575	59.690	0.17	0.17	2.29	79	0.08	1.80	78	-3.2	80	0.090	96	95	2.4	0.0	307	229	227	114	208	217	497	150	82	61	84	62	73	-0.009	5.5	0.76
344	56.740	59.864	0.16	0.17	2.30	79	0.06	1.80	78	-3.5	80	0.090	95	95	2.4	0.0	307	229	227	114	208	217	494	150	82	61	84	62	73	-0.009	5.5	0.76
345	56.906	60.038	0.17	0.17	2.30	79	0.38	1.81	78	-3.2	80	0.080	101	101	2.4	0.0	307	229	227	114	208	217	493	150	82	61	84	62	73	-0.009	5.49	0.75
346	57.072	60.213	0.17	0.18	2.29	79	0.31	1.81	78	-3.5	80	0.090	96	95	2.4	0.0	306	229	227	114	208	217	487	150	82	61	84	62	73	-0.009	5.49	0.76
347	57.237	60.387	0.16	0.17	2.28	79	0.39	1.80	78	-3.3	80	0.080	101	101	2.4	0.0	306	229	227	114	207	217	486	150	82	61	84	62	73	-0.009	5.5	0.75
348	57.402	60.562	0.16	0.17	2.30	79	0.25	1.80	78	-3.2	80	0.080	101	101	2.4	0.0	305	229	227	114	207	216	486	149	82	61	85	62	73	-0.009	5.5	0.75
349	57.568	60.736	0.17	0.17	2.30	79	0.08	1.81	78	-3.3	80	0.080	101	101	2.3	0.0	305	228	227	114	207	216	483	150	82	61	85	62	73	-0.009	5.49	0.75
350	57.734	60.910	0.17	0.17	2.29	79	0.4	1.80	78	-3.5	79	0.080	101	101	2.3	0.0	305	228	226	113	206	216	483	149	83	61	85	62	73	-0.008	5.48	0.74
351	57.899	61.084	0.16	0.17	2.29	79	-0.09	1.80	78	-3.5	79	0.080	101	101	2.3	0.0	305	228	227	113	206	216	481	149	83	61	85	62	73	-0.008	5.49	0.74
352	58.064	61.258	0.16	0.17	2.29	79	0.07	1.81	78	-3.4	79	0.080	101	101	2.3	0.0	304	228	227	113	206	216	479	149	83	61	85	62	73	-0.008	5.49	0.73
353	58.229	61.433	0.16	0.17	2.29	79	0.41	1.79	78	-3.2	79	0.090	95	95	2.3	0.0	304	228	227	113	205	215	481	149	83	61	85	62	73	-0.008	5.49	0.73
354	58.395	61.607	0.17	0.17	2.28	79	0.09	1.80	78	-3.5	79	0.080	101	101	2.2	-0.1	304	227	226	113	205	215	480	149	82	61	85	62	74	-0.008	5.49	0.73
355	58.560	61.781	0.16	0.17	2.28	79	0.09	1.80	78	-3.3	79	0.080	101	101	2.2	0.0	304	227	227	113	204	215	479	149	82	61	84	62	73	-0.008	5.53	0.74
356	58.725	61.955	0.16	0.17	2.29	78	-0.11	1.81	78	-3.5	79	0.080	101	101	2.2	0.0	304	227	226	113	204	215	477	148	82	61	84	62	74	-0.008	5.55	0.74
357	58.890	62.129	0.16	0.17	2.29	78	0.42	1.80	78	-3.5	79	0.080	101	101	2.2	0.0	303	227	226	113	204	215	476	148	82	61	84	62	73	-0.008	5.56	0.73
358	59.056	62.303	0.17	0.17	2.29	78	-0.08	1.80	78	-3.4	79	0.080	101	101	2.2	0.0	303	227	226	112	203	214	476	149	82	61	84	62	73	-0.008	5.56	0.73
359	59.221	62.477	0.16	0.17	2.28	78	0.06	1.81	78	-3.4	79	0.080	101	101	2.2	0.0	303	227	226	112	203	214	474	149	82	61	84	62	73	-0.008	5.58	0.72
360	59.386	62.652	0.17	0.18	2.28	78	0.43	1.80	78	-3.3	79	0.080	101	101	2.2	0.0	303	227	226	112	203	214	473	149	82	61	85	62	73	-0.008	5.57	0.72
361	59.551	62.825	0.16	0.17	2.29	78	0.35	1.79	78	-3.5	79	0.080	101	100	2.2	0.0	303	227	226	112	202	214	474	148	82	61	85	62	73	-0.008	5.57	0.72
362	59.717	63.000	0.17	0.17	2.29	78	0.01	1.79	78	-3.4	79	0.080	101	101	2.2	0.0	303	227	226	112	202	214	474	148	82	61	85	62	73	-0.008	5.58	0.72
363	59.882	63.173	0.16	0.17	2.27	78	-0.08	1.80	78	-3.2	79	0.080	101	100	2.2	0.0	303	227	226	112	202	214	474	148	82	61	85	62	73	-0.008	5.57	0.71
364	60.047	63.348	0.16	0.17	2.29	78	0.43	1.80	78	-3.2	79	0.090	95	95	2.2	0.0	302	227	226	112	201	214	472	148	82	61	85	62	74	-0.008	5.55	0.71
365	60.212	63.521	0.17	0.17	2.29	78	-0.12	1.79	78	-3.2	79	0.080	101	100	2.2	0.0	302	227	226	112	201	214	472	148	83	61	85	62	74	-0.008	5.56	0.71
366	60.378	63.695	0.17	0.17	2.29	78	0.3	1.78	78	-3.3	79	0.090	96	95	2.2	0.0	302	227	226	112	201	214	472	148	83	61	85	62	73	-0.008	5.52	0.7
367	60.543	63.870	0.16	0.17	2.28	78	0.38	1.80	78	-3.5	79	0.080	101	101	2.2	0.0	302	227	226	112	200	213	471	148	83	61	84	62	73	-0.008	5.53	0.7
368	60.708	64.043	0.16	0.17	2.29	78	0.33	1.80	78	-3.5	79	0.090	95	94	2.1	0.0	302	227	226	112	200	213	469	148	83	61	84	62	73	-0.008	5.55	0.73
369	60.873	64.218	0.16	0.17	2.29	78	0.18	1.80	78	-3.2	79	0.090	95	95	2.1	0.0	302	227	226	112	200	213	467	147	82	61	84	62	74	-0.008	5.54	0.73

Wood Heater Test Data

7

Run: 4

Manufacturer: Hearth & Home
Model: Dauntless NC
Tracking No.: 2389
Project No.: 061WS104E
Test Date: 05-Oct-19
Beginning Clock Time: 12:41

Total Sampling Time: 586 min
Recording Interval: 1 min
Background Sample Volume: ____ cubic feet

Meter Box Y Factor: 0.992 (1) 0.989 (2) ____ (Amb)

Barometric Pressure: Begin 29.87 Middle ____ End 29.78 Average 29.83 0

OMNI Equipment Numbers: ____

PM Control Modules: 371, 372
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.282 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 18.88 ft/sec.
Initial Tunnel Flow: 213.4 acfm
Average Tunnel Flow: 209.2 scfm
Post-Test Leak Check (1): 0.000 cfm @ 6 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ 10 in. Hg
Average Test Piece Fuel Moisture: 22.83 Dry Basis %

Technician Signature: ____

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.074	0.082	0.084	0.080	0.074	0.084	0.084	0.076	0.084	"H2O
Temp:	79	79	79	79	79	79	79	79	79	°F

V_{straw} 18.98 ft/sec V_{scent} 19.43 ft/sec F_p 0.977

	Particulate Sampling Data													Fuel Weight (lb)		Temperature Data (°F)											Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst Exit	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
370	61.038	64.391	0.16	0.17	2.28	78	0.25	1.80	78	-3.3	79	0.080	101	100	2.1	0.0	302	227	226	111	200	213	467	147	82	61	84	62	74	-0.008	5.53	0.72
371	61.203	64.566	0.17	0.17	2.28	78	0.31	1.79	78	-3.2	79	0.080	101	101	2.1	0.0	301	227	226	111	199	213	466	147	82	61	84	62	74	-0.007	5.52	0.72
372	61.368	64.739	0.16	0.17	2.29	78	0.2	1.79	78	-3.5	79	0.080	101	100	2.1	0.0	301	227	226	111	199	213	465	146	82	61	85	62	73	-0.007	5.51	0.71
373	61.533	64.914	0.16	0.17	2.30	78	0.14	1.79	78	-3.2	79	0.080	101	101	2.1	0.0	302	227	226	111	199	213	464	146	82	61	85	62	74	-0.008	5.48	0.7
374	61.699	65.087	0.17	0.17	2.28	78	0	1.80	77	-3.2	79	0.080	101	100	2.0	-0.1	302	227	226	111	198	213	463	146	82	61	85	62	73	-0.007	5.5	0.7
375	61.864	65.261	0.16	0.17	2.27	78	0.1	1.80	77	-3.2	79	0.080	101	101	2.0	0.0	302	227	226	111	197	213	462	146	82	61	85	62	73	-0.007	5.46	0.7
376	62.028	65.435	0.16	0.17	2.28	78	0.33	1.79	77	-3.3	79	0.080	100	101	2.0	0.0	302	227	226	110	197	212	462	146	82	62	85	62	73	-0.007	5.46	0.73
377	62.193	65.609	0.16	0.17	2.28	78	0.02	1.80	78	-3.5	79	0.060	116	116	2.0	0.0	302	226	226	110	197	212	461	146	82	62	85	62	74	-0.007	5.48	0.77
378	62.358	65.783	0.16	0.17	2.26	78	0.43	1.79	78	-3.3	80	0.090	95	95	2.0	0.0	302	226	226	110	197	212	461	146	82	62	85	62	73	-0.007	5.47	0.77
379	62.523	65.957	0.17	0.17	2.27	78	0.38	1.80	77	-3.4	80	0.080	101	101	2.0	0.0	302	226	227	110	196	212	460	146	83	62	84	62	74	-0.007	5.5	0.77
380	62.688	66.131	0.16	0.17	2.28	78	0.12	1.80	77	-3.4	79	0.080	101	101	2.0	0.0	303	226	226	110	196	212	457	145	83	62	84	62	74	-0.007	5.53	0.76
381	62.853	66.305	0.16	0.17	2.28	78	0.27	1.80	77	-3.4	79	0.080	101	101	2.0	0.0	302	226	226	110	196	212	454	145	83	62	84	62	74	-0.007	5.52	0.75
382	63.018	66.479	0.16	0.17	2.25	78	-0.12	1.79	78	-3.5	79	0.080	101	101	2.0	0.0	303	226	226	110	195	212	458	146	83	62	84	62	74	-0.007	5.35	0.76
383	63.182	66.653	0.16	0.17	2.26	78	0.35	1.79	78	-3.2	80	0.080	100	101	2.0	0.0	303	226	227	110	195	212	462	146	83	62	84	62	73	-0.007	5.41	0.82
384	63.346	66.827	0.16	0.17	2.26	78	0.1	1.81	78	-3.4	80	0.080	100	101	2.0	0.0	303	226	226	110	195	212	466	146	82	62	85	62	73	-0.007	5.57	0.85
385	63.512	67.000	0.17	0.17	2.27	78	-0.07	1.80	78	-3.5	80	0.090	96	94	2.0	0.0	303	226	226	110	194	212	468	146	82	62	85	62	74	-0.007	5.7	0.87
386	63.676	67.174	0.16	0.17	2.26	78	0.01	1.80	78	-3.5	80	0.080	100	101	2.0	0.0	303	226	226	110	194	212	470	147	82	62	85	62	74	-0.007	5.79	0.88
387	63.841	67.348	0.16	0.17	2.27	78	0.43	1.79	78	-3.2	79	0.080	101	101	2.0	0.0	303	226	226	110	194	212	473	147	82	62	85	63	74	-0.007	5.81	0.88
388	64.005	67.522	0.16	0.17	2.27	79	0.4	1.80	78	-3.2	79	0.080	100	101	1.9	0.0	304	226	226	110	194	212	475	147	82	62	85	63	74	-0.007	5.84	0.86
389	64.170	67.696	0.17	0.17	2.28	78	0.43	1.80	78	-3.5	79	0.080	101	101	1.9	0.0	304	226	227	110	194	212	480	148	82	62	85	62	74	-0.008	5.86	0.86
390	64.334	67.870	0.16	0.17	2.27	78	0.24	1.78	78	-3.3	79	0.080	100	101	1.9	0.0	304	226	226	110	194	212	484	148	82	62	85	63	74	-0.008	5.87	0.86
391	64.499	68.044	0.16	0.17	2.28	78	0.04	1.78	78	-3.4	79	0.080	101	101	1.9	0.0	305	226	227	110	193	212	489	149	82	62	84	63	74	-0.008	5.89	0.85
392	64.664	68.217	0.17	0.17	2.27	78	0.4	1.80	78	-3.4	80	0.080	101	100	1.8	-0.1	304	225	226	110	193	212	490	149	82	62	84	63	74	-0.008	5.88	0.85
393	64.829	68.391	0.16	0.17	2.26	79	0.15	1.79	78	-3.2	80	0.080	101	101	1.8	0.0	305	225	226	110	193	212	492	149	82	62	84	63	74	-0.008	5.87	0.84
394	64.993	68.565	0.16	0.17	2.27	79	-0.08	1.78	78	-3.5	79	0.080	100	101	1.8	0.0	304	225	226	110	192	211	493	149	83	62	84	63	74	-0.008	5.88	0.85
395	65.157	68.739	0.16	0.17	2.27	79	0.09	1.79	78	-3.3	79	0.080	100	101	1.8	0.0	304	225	226	110	192	211	495	149	83	62	84	63	74	-0.008	5.88	0.84
396	65.323	68.912	0.17	0.17	2.27	79	0.39	1.80	78	-3.4	79	0.080	101	100	1.8	0.0	304	226	226	110	192	212	495	149	83	62	85	63	74	-0.008	5.88	0.83
397	65.487	69.086	0.16	0.17	2.25	79	0.44	1.79	78	-3.2	79	0.080	100	101	1.8	0.0	305	226	226	110	192	212	496	150	83	62	85	63	74	-0.008	5.88	0.82
398	65.651	69.260	0.16	0.17	2.26	79	-0.12	1.78	78	-3.4	79	0.080	100	101	1.8	0.0	304	226	226	111	192	212	497	150	83	62	85	63	74	-0.008	5.86	0.81
399	65.816	69.434	0.17	0.17	2.28	79	-0.11	1.80	78	-3.5	79	0.090	95	95	1.8	0.0	304	226	226	111	192	212	497	150	82	62	85	63	75	-0.008	5.85	0.81
400	65.981	69.608	0.16	0.17	2.27	79	-0.12	1.80	78	-3.5	79	0.080	101	101	1.8	0.0	304	226	226	111	192	212	495	151	82	62	85	63	74	-0.008	5.82	0.81
401	66.145	69.781	0.16	0.17	2.26	79	0.37	1.79	78	-3.4	79	0.080	100	100	1.8	0.0	304	226	226	110	192	212	495	151	82	62	85	63	74	-0.008	5.8	0.82
402	66.310	69.955	0.17	0.17	2.27	79	0.18	1.79	78	-3.2	79	0.080	101	101	1.8	0.0	305	226	226	110	191	212	497	151	82	62	85	63	74	-0.008	5.78	0.82
403	66.475	70.128	0.16	0.17	2.28	79	-0.09	1.80	78	-3.5	80	0.080	101	100	1.8	0.0	304	226	225	110	191	211	495	151	82	62	84	63	74	-0.008	5.79	0.81
404	66.640	70.303	0.17	0.17	2.27	79	0.05	1.80	78	-3.4	79	0.080	101	101	1.8	0.0	304	226	225	110	191	211	496	151	82	62	84	63	74	-0.008	5.75	0.79
405	66.804	70.476	0.16	0.17	2.27	79	0.23	1.79	78	-3.2	79	0.080	100	100	1.8	0.0	304	226	225	111	191	211	496	151	82	62	84	63	74	-0.009	5.74	0.79
406	66.968	70.651	0.16	0.17	2.28	79	-0.04	1.79	78	-3.3	79	0.080	100	101	1.7	-0.1	305	226	225	111	190	211	496	152	82	62	84	63	74	-0.008	5.72	0.78

Wood Heater Test Data

7

Run: 4

Manufacturer: Hearth & Home
Model: Dauntless NC
Tracking No.: 2389
Project No.: 061WS104E
Test Date: 05-Oct-19
Beginning Clock Time: 12:41

Total Sampling Time: 586 min
Recording Interval: 1 min
Background Sample Volume: _____ cubic feet

Meter Box Y Factor: 0.992 (1) 0.989 (2) _____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	29.87		29.78	29.83 0

OMNI Equipment Numbers: _____

PM Control Modules: 371, 372
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.282 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 18.88 ft/sec.
Initial Tunnel Flow: 213.4 acfm
Average Tunnel Flow: 209.2 scfm
Post-Test Leak Check (1): 0.000 cfm @ 6 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ 10 in. Hg
Average Test Piece Fuel Moisture: 22.83 Dry Basis %

Technician Signature: _____

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.074	0.082	0.084	0.080	0.074	0.084	0.084	0.076	0.084	"H2O
Temp:	79	79	79	79	79	79	79	79	79	°F

V_{straw} 18.98 ft/sec V_{scent} 19.43 ft/sec F_p 0.977

	Particulate Sampling Data													Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst Exit	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
407	67.134	70.824	0.17	0.17	2.26	79	0.08	1.80	78	-3.2	79	0.080	101	100	1.7	0.0	305	226	225	111	190	211	495	152	82	62	84	63	74	-0.009	5.73	0.78
408	67.298	70.998	0.16	0.17	2.25	79	0.17	1.80	78	-3.4	79	0.080	100	101	1.7	0.0	305	226	225	111	190	211	496	152	82	62	85	63	74	-0.009	5.72	0.78
409	67.463	71.172	0.16	0.17	2.27	79	-0.12	1.79	78	-3.2	79	0.080	101	101	1.7	0.0	306	226	225	111	190	212	495	152	83	62	85	63	74	-0.009	5.74	0.78
410	67.627	71.345	0.16	0.17	2.28	79	0.24	1.80	78	-3.2	79	0.080	100	100	1.6	0.0	305	226	225	111	190	211	494	152	83	62	85	63	74	-0.009	5.72	0.77
411	67.793	71.519	0.17	0.17	2.27	79	0.11	1.79	78	-3.3	79	0.080	101	101	1.6	0.0	305	226	225	111	190	211	490	152	83	62	85	63	73	-0.009	5.72	0.76
412	67.957	71.693	0.16	0.17	2.26	79	0.2	1.79	78	-3.5	80	0.080	100	101	1.6	0.0	305	226	225	111	190	211	491	151	83	62	85	63	74	-0.008	5.7	0.76
413	68.121	71.867	0.16	0.17	2.28	79	-0.1	1.79	78	-3.3	79	0.080	100	101	1.6	0.0	306	226	225	111	189	211	491	151	83	62	85	63	74	-0.009	5.68	0.76
414	68.286	72.040	0.17	0.17	2.28	79	-0.12	1.80	78	-3.2	79	0.090	95	94	1.6	0.0	306	227	224	111	189	211	490	151	83	62	85	63	74	-0.009	5.7	0.75
415	68.451	72.215	0.16	0.17	2.27	79	-0.11	1.79	78	-3.5	79	0.080	101	101	1.6	0.0	306	227	224	111	189	211	490	151	82	62	84	63	74	-0.008	5.7	0.74
416	68.615	72.388	0.16	0.17	2.27	79	-0.13	1.78	78	-3.3	79	0.080	100	100	1.6	0.0	306	227	224	111	189	211	488	151	82	62	84	63	74	-0.009	5.68	0.73
417	68.780	72.562	0.17	0.17	2.27	79	0.28	1.80	78	-3.5	79	0.090	95	95	1.6	0.0	306	227	224	111	189	211	488	152	82	62	84	63	75	-0.009	5.72	0.73
418	68.945	72.736	0.16	0.17	2.26	79	0.02	1.80	78	-3.5	79	0.080	101	101	1.6	0.0	306	227	224	111	189	211	488	152	82	63	84	63	74	-0.009	5.68	0.74
419	69.109	72.910	0.16	0.17	2.26	79	0.22	1.79	78	-3.5	79	0.080	100	101	1.6	0.0	306	227	224	111	189	211	490	152	82	63	84	63	75	-0.009	5.66	0.73
420	69.274	73.084	0.17	0.17	2.27	79	0.08	1.79	78	-3.4	79	0.090	95	95	1.6	0.0	306	227	224	111	189	211	490	152	82	63	85	63	74	-0.009	5.63	0.73
421	69.439	73.258	0.16	0.17	2.28	79	0.14	1.80	78	-3.5	80	0.080	101	101	1.6	0.0	306	227	224	111	188	211	492	152	82	63	85	63	74	-0.009	5.61	0.73
422	69.604	73.431	0.17	0.17	2.26	79	0.42	1.80	78	-3.5	80	0.080	101	100	1.6	0.0	305	227	224	111	188	211	494	152	82	63	85	63	74	-0.009	5.62	0.72
423	69.768	73.605	0.16	0.17	2.24	79	0.27	1.79	78	-3.4	80	0.080	100	101	1.6	0.0	304	227	224	111	188	211	492	152	82	63	85	63	73	-0.009	5.66	0.72
424	69.932	73.779	0.16	0.17	2.27	79	-0.05	1.79	78	-3.4	79	0.080	100	101	1.6	0.0	305	227	224	111	188	211	492	152	83	63	85	63	74	-0.009	5.7	0.72
425	70.097	73.953	0.16	0.17	2.27	79	0.4	1.80	78	-3.2	79	0.080	101	101	1.5	-0.1	304	227	224	111	188	211	493	152	83	63	85	63	74	-0.009	5.71	0.71
426	70.262	74.127	0.17	0.17	2.28	79	0.17	1.80	78	-3.3	79	0.080	101	101	1.5	0.0	304	227	224	111	188	211	493	152	83	63	85	63	74	-0.009	5.72	0.71
427	70.427	74.301	0.17	0.17	2.27	79	0.05	1.79	78	-3.2	79	0.080	101	101	1.5	0.0	304	227	224	111	188	211	493	152	83	63	85	63	74	-0.009	5.7	0.69
428	70.591	74.475	0.16	0.17	2.28	79	0.34	1.78	78	-3.3	79	0.080	100	101	1.5	0.0	304	227	224	111	188	211	495	152	83	63	84	63	74	-0.009	5.68	0.68
429	70.756	74.648	0.17	0.17	2.27	79	0.36	1.80	78	-3.5	79	0.080	101	100	1.4	0.0	304	227	224	111	188	211	494	152	83	63	84	63	74	-0.009	5.65	0.67
430	70.921	74.822	0.17	0.17	2.27	79	0.1	1.80	78	-3.3	79	0.080	101	101	1.4	0.0	304	227	224	111	188	211	494	153	82	63	84	63	74	-0.009	5.67	0.66
431	71.085	74.996	0.16	0.17	2.26	79	0.43	1.78	78	-3.3	79	0.090	94	95	1.4	0.0	304	227	224	111	187	211	492	153	82	63	84	64	74	-0.009	5.68	0.66
432	71.250	75.170	0.17	0.17	2.27	79	0.14	1.79	78	-3.3	80	0.080	101	101	1.4	0.0	303	227	224	111	187	210	492	153	82	63	85	64	74	-0.009	5.65	0.65
433	71.416	75.344	0.17	0.17	2.27	79	0.23	1.80	78	-3.3	80	0.080	101	101	1.4	0.0	303	226	224	111	187	210	491	153	82	63	85	64	74	-0.009	5.63	0.65
434	71.580	75.517	0.16	0.17	2.26	79	0.12	1.79	78	-3.5	79	0.080	100	100	1.4	0.0	303	226	224	111	187	210	491	153	82	63	85	64	74	-0.009	5.64	0.64
435	71.744	75.691	0.16	0.17	2.27	79	-0.11	1.80	78	-3.3	79	0.080	100	101	1.4	0.0	303	226	223	111	187	210	494	153	82	63	85	64	74	-0.009	5.62	0.64
436	71.909	75.865	0.17	0.17	2.27	79	0.35	1.80	78	-3.3	79	0.080	101	101	1.4	0.0	303	226	224	111	187	210	494	152	82	63	85	64	74	-0.009	5.63	0.64
437	72.074	76.040	0.16	0.18	2.27	79	0.07	1.80	78	-3.2	79	0.080	101	101	1.4	0.0	302	226	224	111	187	210	492	152	82	63	85	64	74	-0.009	5.6	0.63
438	72.238	76.213	0.16	0.17	2.26	79	0.42	1.79	78	-3.2	79	0.080	100	100	1.4	0.0	303	226	224	111	187	210	492	152	82	63	85	64	74	-0.009	5.6	0.62
439	72.403	76.387	0.17	0.17	2.27	79	0.42	1.79	78	-3.4	79	0.090	95	95	1.4	0.0	303	226	224	111	187	210	493	153	82	63	85	64	74	-0.009	5.6	0.62
440	72.568	76.561	0.16	0.17	2.28	79	0.28	1.80	78	-3.2	79	0.080	101	101	1.4	0.0	303	226	224	111	187	210	491	152	83	63	84	64	75	-0.009	5.59	0.61
441	72.733	76.735	0.17	0.17	2.26	79	0.14	1.79	78	-3.4	79	0.080	101	101	1.4	0.0	303	226	224	111	186	210	489	152	83	63	84	64	74	-0.009	5.59	0.61
442	72.897	76.909	0.16	0.17	2.27	79	0.3	1.79	78	-3.5	79	0.090	94	95	1.4	0.0	303	226	224	111	186	210	489	152	83	63	84	64	74	-0.009	5.57	0.6
443	73.062	77.083	0.16	0.17	2.28	79	0.42	1.78	78	-3.3	79	0.080	101	101	1.4	0.0	303	226	224	111	186	210	487	152	83	63	84	64	74	-0.009	5.55	0.6

Wood Heater Test Data

7

Run: 4

Manufacturer: Hearth & Home
Model: Dauntless NC
Tracking No.: 2389
Project No.: 061WS104E
Test Date: 05-Oct-19
Beginning Clock Time: 12:41

Total Sampling Time: 586 min
Recording Interval: 1 min
Background Sample Volume: ____ cubic feet

Meter Box Y Factor: 0.992 (1) 0.989 (2) ____ (Amb)

Barometric Pressure: Begin 29.87 Middle ____ End 29.78 Average 29.83 0

OMNI Equipment Numbers: ____

PM Control Modules: 371, 372
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.282 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 18.88 ft/sec.
Initial Tunnel Flow: 213.4 acfm
Average Tunnel Flow: 209.2 scfm
Post-Test Leak Check (1): 0.000 cfm @ 6 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ 10 in. Hg
Average Test Piece Fuel Moisture: 22.83 Dry Basis %

Technician Signature: ____

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.074	0.082	0.084	0.080	0.074	0.084	0.084	0.076	0.084	"H2O
Temp:	79	79	79	79	79	79	79	79	79	°F

V_{straw} 18.98 ft/sec V_{scent} 19.43 ft/sec F_p 0.977

	Particulate Sampling Data													Fuel Weight (lb)		Temperature Data (°F)											Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst Exit	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
444	73.227	77.256	0.17	0.17	2.28	79	0.4	1.80	78	-3.4	79	0.090	95	94	1.4	0.0	303	226	224	111	187	210	490	152	83	63	84	64	74	-0.009	5.51	0.59
445	73.391	77.430	0.16	0.17	2.25	79	0.26	1.80	78	-3.3	79	0.080	100	101	1.3	-0.1	303	226	224	111	187	210	495	152	82	63	85	64	74	-0.009	5.53	0.59
446	73.556	77.604	0.16	0.17	2.26	79	0.04	1.80	78	-3.2	79	0.080	101	101	1.3	0.0	302	225	224	111	186	210	492	152	82	63	85	64	74	-0.009	5.61	0.67
447	73.720	77.778	0.16	0.17	2.27	79	0.03	1.80	78	-3.2	79	0.080	100	101	1.3	0.0	303	226	224	111	186	210	488	152	82	63	85	64	74	-0.008	5.7	0.76
448	73.886	77.953	0.17	0.17	2.27	79	0.4	1.79	78	-3.3	79	0.080	101	101	1.3	0.0	303	226	224	111	186	210	485	152	82	63	85	64	74	-0.008	5.67	0.77
449	74.050	78.126	0.16	0.17	2.28	79	0.35	1.80	78	-3.3	79	0.080	100	100	1.2	0.0	304	226	224	111	186	210	485	152	82	63	85	64	74	-0.008	5.64	0.76
450	74.214	78.301	0.16	0.17	2.27	79	0.09	1.79	78	-3.5	79	0.080	100	101	1.2	0.0	304	226	224	111	186	210	485	152	82	63	85	64	74	-0.009	5.63	0.75
451	74.379	78.474	0.17	0.17	2.28	79	0.35	1.80	78	-3.5	79	0.080	101	100	1.2	0.0	304	225	224	111	186	210	484	152	82	63	84	64	74	-0.009	5.66	0.74
452	74.544	78.648	0.16	0.17	2.27	79	0.33	1.80	78	-3.3	79	0.080	101	101	1.2	0.0	305	225	224	111	186	210	484	152	82	63	84	64	74	-0.009	5.64	0.73
453	74.709	78.822	0.17	0.17	2.26	79	0.42	1.79	78	-3.2	79	0.080	101	101	1.2	0.0	305	225	224	111	186	210	485	152	82	63	84	64	73	-0.009	5.62	0.72
454	74.873	78.995	0.16	0.17	2.27	79	0.08	1.81	78	-3.2	80	0.080	100	100	1.2	0.0	304	225	224	111	186	210	483	152	82	63	84	64	73	-0.009	5.62	0.72
455	75.038	79.169	0.16	0.17	2.25	79	-0.05	1.79	78	-3.5	79	0.080	101	101	1.2	0.0	304	225	224	111	186	210	485	151	83	63	84	64	74	-0.009	5.64	0.72
456	75.203	79.343	0.17	0.17	2.25	79	-0.04	1.80	78	-3.3	79	0.090	95	95	1.2	0.0	305	225	224	111	185	210	484	151	83	63	84	64	74	-0.009	5.64	0.72
457	75.367	79.517	0.16	0.17	2.27	79	-0.1	1.80	78	-3.5	79	0.080	100	101	1.2	0.0	305	225	224	111	186	210	483	151	83	63	85	64	74	-0.009	5.58	0.71
458	75.532	79.691	0.16	0.17	2.28	79	0.34	1.80	78	-3.5	79	0.080	101	101	1.2	0.0	305	225	224	111	186	210	484	152	83	63	85	64	74	-0.009	5.52	0.71
459	75.697	79.865	0.17	0.17	2.27	79	-0.03	1.79	78	-3.2	79	0.080	101	101	1.2	0.0	305	225	224	111	186	210	486	152	83	63	85	64	74	-0.009	5.55	0.72
460	75.861	80.039	0.16	0.17	2.25	79	0	1.79	78	-3.5	79	0.080	100	101	1.2	0.0	305	224	224	111	186	210	485	152	82	63	85	64	74	-0.009	5.58	0.72
461	76.025	80.213	0.16	0.17	2.26	79	-0.05	1.80	78	-3.2	79	0.090	94	95	1.2	0.0	306	224	224	111	186	210	485	152	82	63	85	64	74	-0.009	5.59	0.72
462	76.190	80.386	0.16	0.17	2.28	79	0.15	1.80	78	-3.5	79	0.090	95	94	1.2	0.0	306	224	224	111	186	210	483	152	82	63	85	64	74	-0.009	5.58	0.72
463	76.355	80.560	0.17	0.17	2.26	79	0.21	1.79	78	-3.2	79	0.080	101	101	1.2	0.0	307	224	224	111	186	210	483	152	82	63	85	64	74	-0.009	5.57	0.71
464	76.520	80.734	0.16	0.17	2.26	79	0.16	1.79	78	-3.4	79	0.090	95	95	1.2	0.0	307	224	224	111	186	210	483	152	82	63	84	64	74	-0.009	5.58	0.71
465	76.684	80.908	0.16	0.17	2.27	79	0.38	1.81	78	-3.2	79	0.080	100	101	1.1	-0.1	307	224	224	111	186	210	483	152	82	63	84	64	73	-0.009	5.59	0.71
466	76.849	81.082	0.17	0.17	2.27	79	0.31	1.81	78	-3.3	79	0.080	101	101	1.1	0.0	307	224	224	111	186	210	483	152	82	63	84	64	74	-0.009	5.58	0.7
467	77.014	81.256	0.16	0.17	2.26	79	0.12	1.79	78	-3.2	79	0.090	95	95	1.1	0.0	308	224	224	111	186	211	481	152	82	63	84	64	74	-0.009	5.57	0.7
468	77.178	81.430	0.16	0.17	2.27	79	0.03	1.80	78	-3.2	79	0.080	100	101	1.1	0.0	307	224	224	111	186	210	479	152	82	64	84	64	74	-0.009	5.56	0.69
469	77.343	81.603	0.17	0.17	2.27	79	-0.09	1.81	78	-3.4	79	0.080	101	100	1.0	0.0	307	224	224	112	186	211	479	152	82	64	85	64	74	-0.009	5.56	0.69
470	77.508	81.778	0.16	0.18	2.25	79	0.33	1.80	78	-3.5	79	0.080	101	101	1.0	0.0	307	224	224	112	186	211	480	152	83	64	85	64	74	-0.009	5.57	0.69
471	77.673	81.951	0.17	0.17	2.24	79	0.43	1.78	78	-3.3	79	0.080	101	100	1.0	0.0	307	224	224	112	186	211	479	152	83	64	85	64	74	-0.009	5.56	0.68
472	77.837	82.126	0.16	0.18	2.27	79	0.3	1.79	78	-3.2	79	0.080	100	101	1.0	0.0	308	224	224	112	186	211	478	152	83	64	85	64	74	-0.009	5.54	0.67
473	78.001	82.299	0.16	0.17	2.27	79	0.07	1.80	78	-3.3	79	0.080	100	100	1.0	0.0	308	224	224	112	186	211	479	152	83	64	85	64	74	-0.009	5.53	0.67
474	78.166	82.473	0.16	0.17	2.27	79	0.26	1.79	78	-3.3	79	0.090	95	95	1.0	0.0	308	224	224	112	186	211	478	152	83	64	85	64	74	-0.009	5.53	0.67
475	78.331	82.647	0.17	0.17	2.25	79	0.43	1.78	78	-3.2	79	0.080	101	101	1.0	0.0	309	224	224	112	186	211	477	152	82	64	85	64	74	-0.009	5.53	0.66
476	78.495	82.821	0.16	0.17	2.27	79	-0.13	1.80	78	-3.2	79	0.080	100	101	1.0	0.0	309	224	224	112	187	211	477	152	82	64	84	64	74	-0.009	5.55	0.66
477	78.660	82.995	0.16	0.17	2.27	79	0.29	1.80	78	-3.2	79	0.080	101	101	1.0	0.0	309	224	224	112	187	211	476	152	82	64	84	64	74	-0.009	5.54	0.65
478	78.825	83.168	0.17	0.17	2.27	79	0.41	1.80	78	-3.3	79	0.090	95	94	1.0	0.0	309	223	224	112	187	211	476	152	82	64	84	64	74	-0.009	5.53	0.65
479	78.989	83.343	0.16	0.17	2.26	79	0	1.80	78	-3.5	79	0.080	100	101	1.0	0.0	309	223	224	112	187	211	475	152	82	64	84	64	74	-0.009	5.54	0.65
480	79.154	83.516	0.16	0.17	2.27	79	0.42	1.81	78	-3.2	79	0.090	95	94	0.9	-0.1	309	223	225	112	187	211	474	152	82	64	84	64	74	-0.009	5.55	0.65

Wood Heater Test Data

7

Run: 4

Manufacturer: Hearth & Home
Model: Dauntless NC
Tracking No.: 2389
Project No.: 061WS104E
Test Date: 05-Oct-19
Beginning Clock Time: 12:41

Total Sampling Time: 586 min
Recording Interval: 1 min
Background Sample Volume: ____ cubic feet

Meter Box Y Factor: 0.992 (1) 0.989 (2) ____ (Amb)

Barometric Pressure: Begin 29.87 Middle ____ End 29.78 Average 29.83 0

OMNI Equipment Numbers: ____

PM Control Modules: 371, 372
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.282 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 18.88 ft/sec.
Initial Tunnel Flow: 213.4 acfm
Average Tunnel Flow: 209.2 scfm
Post-Test Leak Check (1): 0.000 cfm @ 6 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ 10 in. Hg
Average Test Piece Fuel Moisture: 22.83 Dry Basis %

Technician Signature: ____

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.074	0.082	0.084	0.080	0.074	0.084	0.084	0.076	0.084	"H2O
Temp:	79	79	79	79	79	79	79	79	79	°F

V_{straw} 18.98 ft/sec V_{scent} 19.43 ft/sec F_p 0.977

	Particulate Sampling Data													Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst Exit	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
481	79.319	83.691	0.17	0.17	2.26	79	-0.1	1.80	78	-3.2	79	0.080	101	101	0.9	0.0	309	223	224	112	187	211	475	152	82	64	85	64	74	-0.009	5.54	0.64
482	79.484	83.864	0.16	0.17	2.26	79	0.35	1.79	78	-3.5	79	0.080	101	100	0.9	0.0	309	223	224	112	187	211	474	151	82	64	85	64	74	-0.009	5.52	0.64
483	79.648	84.038	0.16	0.17	2.27	79	-0.02	1.78	78	-3.2	79	0.080	100	101	0.9	0.0	310	223	225	112	187	211	472	151	82	64	85	64	74	-0.008	5.52	0.63
484	79.813	84.212	0.17	0.17	2.27	79	0.35	1.80	78	-3.2	79	0.080	101	101	0.9	0.0	309	223	225	112	187	211	471	151	82	64	85	64	74	-0.009	5.54	0.63
485	79.978	84.386	0.16	0.17	2.26	79	-0.04	1.80	78	-3.2	79	0.080	101	101	0.9	0.0	310	223	225	112	187	211	473	151	83	64	85	64	74	-0.008	5.53	0.63
486	80.142	84.560	0.16	0.17	2.26	79	0.26	1.79	78	-3.2	79	0.080	100	101	0.9	0.0	309	223	225	112	187	211	476	151	83	64	85	64	74	-0.009	5.52	0.62
487	80.306	84.733	0.16	0.17	2.27	79	0.05	1.80	78	-3.3	79	0.080	100	100	0.9	0.0	309	222	225	111	187	211	477	151	83	64	85	64	74	-0.009	5.52	0.63
488	80.471	84.908	0.17	0.17	2.27	79	0.43	1.80	78	-3.5	79	0.090	95	95	0.9	0.0	309	222	225	112	187	211	476	151	83	64	84	64	74	-0.009	5.54	0.64
489	80.636	85.081	0.16	0.17	2.27	79	0.43	1.79	78	-3.2	79	0.080	101	100	0.9	0.0	309	222	225	112	187	211	476	151	83	64	84	64	74	-0.009	5.54	0.64
490	80.801	85.256	0.17	0.17	2.26	79	-0.09	1.79	78	-3.2	79	0.080	101	101	0.9	0.0	309	222	225	112	187	211	472	151	82	64	84	64	74	-0.008	5.55	0.64
491	80.965	85.429	0.16	0.17	2.26	79	-0.02	1.80	78	-3.5	79	0.080	100	100	0.9	0.0	309	222	225	111	187	211	470	151	82	64	84	64	74	-0.008	5.55	0.64
492	81.130	85.603	0.16	0.17	2.27	79	-0.13	1.80	78	-3.3	79	0.080	101	101	0.9	0.0	309	222	225	111	187	211	470	151	82	64	84	64	74	-0.008	5.54	0.65
493	81.295	85.777	0.17	0.17	2.25	79	0.39	1.79	78	-3.4	79	0.080	101	101	0.9	0.0	309	222	225	112	187	211	470	151	82	64	85	64	74	-0.008	5.54	0.64
494	81.459	85.951	0.16	0.17	2.27	79	0.42	1.79	78	-3.5	79	0.090	94	95	0.9	0.0	309	222	225	112	187	211	469	151	82	64	85	64	74	-0.008	5.55	0.64
495	81.624	86.125	0.16	0.17	2.28	79	-0.1	1.80	78	-3.5	79	0.090	95	95	0.9	0.0	308	222	225	112	187	211	469	151	82	64	85	64	74	-0.008	5.54	0.64
496	81.789	86.298	0.17	0.17	2.25	79	-0.12	1.80	78	-3.2	79	0.090	95	94	0.9	0.0	309	221	225	111	187	211	468	151	82	64	85	64	74	-0.008	5.53	0.64
497	81.954	86.472	0.16	0.17	2.26	79	0.43	1.79	78	-3.2	79	0.080	101	101	0.8	0.0	309	221	224	112	187	211	468	150	82	64	85	65	74	-0.008	5.49	0.65
498	82.118	86.646	0.16	0.17	2.27	79	-0.07	1.80	78	-3.2	79	0.080	100	101	0.8	0.0	309	221	224	112	187	211	466	150	82	64	85	65	74	-0.008	5.51	0.65
499	82.282	86.821	0.16	0.17	2.27	79	-0.11	1.81	78	-3.5	79	0.080	100	101	0.8	0.0	309	221	224	112	187	211	466	150	82	64	84	65	74	-0.008	5.5	0.65
500	82.448	86.994	0.17	0.17	2.26	79	0.41	1.80	78	-3.4	79	0.080	101	100	0.8	0.0	308	221	224	112	188	211	466	151	83	64	84	65	74	-0.009	5.52	0.65
501	82.612	87.169	0.16	0.17	2.27	79	0.29	1.80	78	-3.2	79	0.080	100	101	0.8	0.0	308	221	224	112	187	210	465	150	83	64	84	65	74	-0.008	5.54	0.65
502	82.777	87.342	0.17	0.17	2.27	79	0.19	1.81	78	-3.3	79	0.080	101	100	0.7	-0.1	308	221	224	112	187	210	466	151	83	64	84	65	74	-0.008	5.54	0.65
503	82.941	87.516	0.16	0.17	2.27	79	-0.13	1.79	78	-3.5	79	0.080	100	101	0.7	0.0	308	221	224	112	187	210	466	150	83	64	84	65	74	-0.008	5.53	0.64
504	83.106	87.690	0.16	0.17	2.24	79	-0.12	1.79	78	-3.2	79	0.080	101	101	0.7	0.0	307	221	224	112	188	210	466	151	83	64	84	65	74	-0.008	5.51	0.64
505	83.270	87.864	0.16	0.17	2.26	79	-0.11	1.81	78	-3.3	79	0.090	94	95	0.7	0.0	307	221	223	112	188	210	466	150	82	64	85	65	74	-0.008	5.51	0.64
506	83.435	88.038	0.17	0.17	2.26	79	0.4	1.80	78	-3.5	79	0.080	101	101	0.7	0.0	308	221	224	112	188	211	466	150	82	64	85	65	74	-0.008	5.51	0.63
507	83.601	88.212	0.17	0.17	2.27	79	0.43	1.80	78	-3.4	79	0.080	101	101	0.7	0.0	307	221	223	112	187	210	465	150	82	64	85	65	74	-0.008	5.5	0.63
508	83.765	88.386	0.16	0.17	2.25	79	0.41	1.80	78	-3.4	79	0.080	100	101	0.7	0.0	306	221	223	112	187	210	465	150	82	64	85	65	74	-0.008	5.5	0.63
509	83.929	88.559	0.16	0.17	2.26	79	-0.03	1.81	78	-3.3	79	0.080	100	100	0.7	0.0	306	221	223	112	187	210	467	150	82	64	85	65	74	-0.008	5.52	0.63
510	84.093	88.734	0.16	0.17	2.28	79	0.23	1.80	78	-3.3	79	0.080	100	101	0.7	0.0	306	221	223	112	187	210	468	150	82	64	85	65	74	-0.008	5.52	0.63
511	84.259	88.908	0.17	0.17	2.26	79	0.09	1.79	78	-3.3	79	0.090	95	95	0.7	0.0	305	221	222	112	187	209	469	149	82	64	85	65	74	-0.008	5.5	0.64
512	84.423	89.082	0.16	0.17	2.26	79	-0.08	1.79	78	-3.2	79	0.080	100	101	0.7	0.0	305	222	222	112	187	210	468	150	82	64	84	65	74	-0.008	5.45	0.64
513	84.588	89.255	0.16	0.17	2.27	79	-0.11	1.80	78	-3.2	79	0.080	101	100	0.7	0.0	305	222	222	112	187	210	471	150	82	64	84	65	74	-0.008	5.44	0.64
514	84.752	89.429	0.16	0.17	2.25	79	-0.12	1.79	78	-3.5	79	0.090	94	95	0.7	0.0	304	222	222	112	188	210	470	150	82	64	84	65	74	-0.009	5.44	0.64
515	84.917	89.603	0.17	0.17	2.26	79	0.17	1.79	78	-3.5	79	0.080	101	101	0.7	0.0	304	222	222	112	187	209	469	150	83	64	84	65	74	-0.008	5.41	0.63
516	85.081	89.777	0.16	0.17	2.27	79	-0.1	1.81	78	-3.4	79	0.080	100	101	0.7	0.0	305	222	222	112	187	210	468	150	83	64	84	65	74	-0.008	5.39	0.63
517	85.246	89.951	0.16	0.17	2.27	79	0.41	1.80	78	-3.3	79	0.090	95	95	0.7	0.0	304	221	221	112	187	209	469	150	83	64	85	65	73	-0.008	5.39	0.63

Wood Heater Test Data

7

Run: 4

Manufacturer: Hearth & Home
Model: Dauntless NC
Tracking No.: 2389
Project No.: 061WS104E
Test Date: 05-Oct-19
Beginning Clock Time: 12:41

Total Sampling Time: 586 min
Recording Interval: 1 min
Background Sample Volume: ____ cubic feet

Meter Box Y Factor: 0.992 (1) 0.989 (2) ____ (Amb)

Barometric Pressure:	Begin	Middle	End	Average
	29.87		29.78	29.83 0

OMNI Equipment Numbers: ____

PM Control Modules: 371, 372
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.282 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 18.88 ft/sec.
Initial Tunnel Flow: 213.4 scfm
Average Tunnel Flow: 209.2 scfm
Post-Test Leak Check (1): 0.000 cfm @ 6 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ 10 in. Hg
Average Test Piece Fuel Moisture: 22.83 Dry Basis %

Technician Signature: ____

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.074	0.082	0.084	0.080	0.074	0.084	0.084	0.076	0.084	"H2O
Temp:	79	79	79	79	79	79	79	79	79	°F

V_{straw} 18.98 ft/sec V_{scent} 19.43 ft/sec F_p 0.977

	Particulate Sampling Data														Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst Exit	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
518	85.411	90.125	0.17	0.17	2.27	79	0.27	1.80	78	-3.4	79	0.080	101	101	0.6	0.0	304	221	221	112	187	209	468	150	83	64	85	65	74	-0.008	5.38	0.62
519	85.576	90.299	0.16	0.17	2.25	79	0.37	1.79	78	-3.4	79	0.090	95	95	0.6	0.0	303	221	221	112	187	209	467	150	83	64	85	65	74	-0.008	5.35	0.62
520	85.740	90.472	0.16	0.17	2.26	79	0.07	1.81	78	-3.3	79	0.080	100	100	0.6	0.0	303	222	221	112	187	209	466	149	82	64	85	65	74	-0.008	5.33	0.61
521	85.904	90.647	0.16	0.18	2.28	79	0.2	1.80	78	-3.3	78	0.080	100	101	0.6	0.0	303	222	221	112	186	209	470	149	82	64	85	65	74	-0.008	5.3	0.61
522	86.069	90.821	0.17	0.17	2.27	79	0.22	1.79	78	-3.5	79	0.080	101	101	0.6	0.0	302	222	220	112	186	208	473	149	82	64	85	65	74	-0.008	5.29	0.61
523	86.234	90.995	0.16	0.17	2.26	79	0.42	1.80	78	-3.3	79	0.080	101	101	0.6	0.0	301	222	220	112	187	208	473	149	82	64	84	65	74	-0.008	5.37	0.62
524	86.398	91.168	0.16	0.17	2.27	79	0.16	1.80	78	-3.5	79	0.080	100	100	0.5	-0.1	301	222	220	112	187	208	471	149	82	64	84	65	74	-0.008	5.41	0.62
525	86.563	91.342	0.17	0.17	2.27	79	0.06	1.79	78	-3.3	79	0.080	101	101	0.5	0.0	301	222	219	112	186	208	470	149	82	64	84	65	74	-0.008	5.4	0.62
526	86.728	91.516	0.16	0.17	2.26	79	-0.08	1.79	78	-3.5	79	0.090	95	95	0.5	0.0	301	222	220	112	186	208	469	149	82	64	84	65	74	-0.008	5.39	0.62
527	86.893	91.690	0.17	0.17	2.26	79	-0.08	1.81	78	-3.4	79	0.090	95	95	0.5	0.0	300	222	219	112	186	208	475	149	82	64	84	65	74	-0.008	5.36	0.61
528	87.057	91.864	0.16	0.17	2.27	79	0.26	1.80	78	-3.4	79	0.080	100	101	0.5	0.0	299	221	219	112	186	207	480	150	82	64	85	65	73	-0.008	5.33	0.6
529	87.222	92.038	0.16	0.17	2.26	79	0.05	1.79	78	-3.2	79	0.080	101	101	0.5	0.0	298	221	219	112	186	207	484	150	82	64	85	65	73	-0.008	5.38	0.64
530	87.387	92.212	0.17	0.17	2.24	79	0.19	1.79	78	-3.2	78	0.080	101	100	0.5	0.0	298	221	218	112	186	207	485	150	83	64	85	65	74	-0.009	5.41	0.7
531	87.551	92.386	0.16	0.17	2.26	79	-0.02	1.81	78	-3.5	78	0.080	100	100	0.5	0.0	297	221	218	112	186	207	486	150	83	64	85	65	74	-0.009	5.44	0.71
532	87.716	92.560	0.16	0.17	2.27	79	-0.12	1.80	78	-3.4	79	0.080	101	101	0.5	0.0	296	221	218	112	186	207	486	150	83	64	85	65	74	-0.009	5.43	0.71
533	87.881	92.734	0.17	0.17	2.26	79	0.2	1.78	78	-3.2	78	0.080	101	100	0.5	0.0	296	221	218	112	185	206	486	150	83	64	85	65	74	-0.009	5.46	0.71
534	88.045	92.908	0.16	0.17	2.25	79	0.43	1.80	78	-3.5	78	0.080	100	100	0.5	0.0	295	221	217	112	186	206	487	151	83	64	85	65	74	-0.009	5.44	0.7
535	88.209	93.082	0.16	0.17	2.27	79	-0.02	1.81	78	-3.5	78	0.080	100	100	0.5	0.0	295	221	217	112	186	206	486	151	82	64	84	65	74	-0.009	5.44	0.7
536	88.374	93.255	0.16	0.17	2.28	79	-0.09	1.79	78	-3.5	79	0.090	95	94	0.5	0.0	294	221	217	112	186	206	487	152	82	64	84	65	74	-0.009	5.43	0.69
537	88.539	93.429	0.17	0.17	2.26	79	0.37	1.79	78	-3.4	79	0.090	95	95	0.5	0.0	294	221	217	112	186	206	488	151	82	64	84	65	73	-0.009	5.41	0.68
538	88.703	93.603	0.16	0.17	2.26	79	0.16	1.81	78	-3.3	79	0.080	100	101	0.5	0.0	294	221	217	112	186	206	489	152	82	64	84	65	73	-0.009	5.39	0.68
539	88.868	93.777	0.16	0.17	2.27	79	0.07	1.81	78	-3.4	78	0.090	95	95	0.4	0.0	293	221	216	112	185	205	489	151	82	64	84	65	74	-0.009	5.41	0.69
540	89.033	93.951	0.17	0.17	2.26	79	0.29	1.80	78	-3.5	79	0.080	101	101	0.4	0.0	293	221	216	112	185	205	488	152	82	64	85	65	74	-0.009	5.36	0.68
541	89.198	94.125	0.16	0.17	2.25	79	0.4	1.79	78	-3.3	79	0.080	101	101	0.4	0.0	293	221	216	112	185	205	487	152	82	64	85	65	74	-0.009	5.38	0.68
542	89.362	94.299	0.16	0.17	2.27	79	-0.06	1.80	78	-3.4	79	0.090	94	95	0.4	0.0	293	221	216	112	185	205	488	152	82	64	85	65	74	-0.009	5.36	0.68
543	89.526	94.473	0.16	0.17	2.27	79	0.36	1.80	78	-3.3	79	0.080	100	101	0.4	0.0	292	221	216	112	185	205	486	152	82	64	85	65	74	-0.009	5.35	0.67
544	89.691	94.647	0.17	0.17	2.27	79	0.26	1.79	78	-3.2	78	0.080	101	100	0.4	0.0	292	221	216	112	185	205	486	153	82	64	85	65	74	-0.009	5.31	0.66
545	89.856	94.821	0.16	0.17	2.25	79	-0.11	1.80	78	-3.5	79	0.080	101	101	0.4	0.0	291	221	215	112	185	205	487	153	83	64	85	65	74	-0.009	5.29	0.65
546	90.020	94.995	0.16	0.17	2.27	79	0.42	1.81	78	-3.3	79	0.080	100	101	0.3	-0.1	291	221	215	112	185	205	484	153	83	64	85	65	74	-0.009	5.27	0.65
547	90.185	95.169	0.17	0.17	2.27	79	0.13	1.80	78	-3.2	78	0.080	101	100	0.3	0.0	291	221	215	112	184	205	485	153	83	64	84	65	74	-0.009	5.26	0.64
548	90.350	95.343	0.16	0.17	2.26	79	0.09	1.80	78	-3.2	79	0.090	95	95	0.3	0.0	290	221	215	112	184	204	485	153	83	64	84	65	74	-0.009	5.27	0.64
549	90.513	95.516	0.16	0.17	2.26	79	0.43	1.81	78	-3.4	79	0.090	94	94	0.3	0.0	290	221	215	112	184	204	484	153	83	65	84	65	74	-0.009	5.25	0.64
550	90.678	95.691	0.16	0.17	2.27	79	0.22	1.81	78	-3.4	78	0.080	101	101	0.3	0.0	290	221	215	112	184	204	483	153	82	65	84	65	74	-0.009	5.27	0.64
551	90.844	95.865	0.17	0.17	2.25	79	0.06	1.80	78	-3.4	78	0.080	101	100	0.3	0.0	290	221	214	112	184	204	484	153	82	65	84	65	74	-0.009	5.25	0.63
552	91.008	96.039	0.16	0.17	2.25	79	0.04	1.79	78	-3.4	79	0.080	100	101	0.3	0.0	290	221	214	112	184	204	482	153	82	65	84	65	74	-0.009	5.2	0.62
553	91.172	96.213	0.16	0.17	2.27	79	0.27	1.80	78	-3.2	78	0.090	94	95	0.3	0.0	290	221	214	112	183	204	480	153	82	65	85	65	74	-0.009	5.17	0.62
554	91.336	96.386	0.16	0.17	2.27	79	0.25	1.80	78	-3.2	79	0.090	94	94	0.3	0.0	289	221	214	112	184	204	479	153	82	65	85	65	74	-0.009	5.12	0.61

Wood Heater Test Data

7

Run: 4

Manufacturer: Hearth & Home
Model: Dauntless NC
Tracking No.: 2389
Project No.: 061WS104E
Test Date: 05-Oct-19
Beginning Clock Time: 12:41

Total Sampling Time: 586 min
Recording Interval: 1 min
Background Sample Volume: _____ cubic feet

Meter Box Y Factor: 0.992 (1) 0.989 (2) _____ (Amb)

Barometric Pressure: Begin 29.87 Middle _____ End 29.78 Average 29.83 0

OMNI Equipment Numbers: _____

PM Control Modules: 371, 372
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.78 lb/lb-mole
Dilution Tunnel H2O: 2.00 percent
Dilution Tunnel Static: -0.282 "H2O
Tunnel Area: 0.19635 ft2
Pitot Tube Cp: 0.99

Avg. Tunnel Velocity: 18.88 ft/sec.
Initial Tunnel Flow: 213.4 acfm
Average Tunnel Flow: 209.2 scfm
Post-Test Leak Check (1): 0.000 cfm @ 6 in. Hg
Post-Test Leak Check (2): 0.000 cfm @ 10 in. Hg
Average Test Piece Fuel Moisture: 22.83 Dry Basis %

Technician Signature: _____

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	Center	
Initial dP	0.074	0.082	0.084	0.080	0.074	0.084	0.084	0.076	0.084	"H2O
Temp:	79	79	79	79	79	79	79	79	79	°F

V_{straw} 18.98 ft/sec V_{scent} 19.43 ft/sec F_p 0.977

	Particulate Sampling Data													Fuel Weight (lb)		Temperature Data (°F)												Stack Gas Data		
Elapsed Time (min)	Gas Meter 1 (ft^3)	Gas Meter 2 (ft^3)	Sample Rate 1 (cfm)	Sample Rate 2 (cfm)	Orifice dH 1 ("H_2O)	Meter 1 Temp (°F)	Meter 1 Vacuum ("Hg)	Orifice dH 2 ("H_2O)	Meter 2 Temp (°F)	Meter 2 Vacuum ("Hg)	Dilution Tunnel (°F)	Dilution Tunnel Center dP	Pro. Rate 1	Pro. Rate 2	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Avg. Stove Surface	Catalyst Exit	Stack	Filter 1	Dryer Exit 1	Filter 2	Dryer Exit 2	Ambient	Draft ("H_2O)	CO_2 (%)	CO (%)
555	91.501	96.560	0.17	0.17	2.27	79	0.4	1.80	78	-3.4	79	0.080	101	101	0.3	0.0	289	221	214	112	184	204	477	153	82	65	85	65	74	-0.009	5.1	0.6
556	91.665	96.734	0.16	0.17	2.27	79	-0.08	1.79	78	-3.5	79	0.090	94	95	0.3	0.0	289	221	214	112	183	204	476	152	82	65	85	65	74	-0.009	5.09	0.59
557	91.830	96.908	0.16	0.17	2.27	79	0.19	1.81	78	-3.3	78	0.080	101	100	0.3	0.0	289	221	214	112	183	204	477	153	82	65	85	65	74	-0.009	5.08	0.59
558	91.995	97.082	0.17	0.17	2.28	79	-0.03	1.80	78	-3.2	79	0.080	101	101	0.3	0.0	288	221	214	112	183	204	477	153	82	65	85	65	74	-0.009	5.07	0.58
559	92.160	97.256	0.16	0.17	2.24	79	0.43	1.80	78	-3.3	79	0.090	95	95	0.3	0.0	288	221	214	112	183	204	478	153	82	65	84	65	74	-0.009	5.06	0.58
560	92.324	97.430	0.16	0.17	2.26	79	0.42	1.80	78	-3.4	78	0.080	100	100	0.3	0.0	288	221	214	112	183	204	479	154	83	65	84	65	74	-0.010	5.1	0.58
561	92.488	97.604	0.16	0.17	2.27	79	-0.04	1.80	78	-3.5	79	0.080	100	101	0.2	-0.1	288	221	213	112	182	203	478	154	83	65	84	65	74	-0.009	5.08	0.58
562	92.653	97.778	0.17	0.17	2.25	79	-0.06	1.79	78	-3.4	78	0.080	101	100	0.2	0.0	287	221	214	112	182	203	479	154	83	65	84	65	74	-0.009	5.06	0.59
563	92.817	97.952	0.16	0.17	2.26	79	0.42	1.80	78	-3.3	79	0.080	100	101	0.2	0.0	288	221	214	112	182	203	477	154	83	65	84	65	74	-0.010	5.06	0.58
564	92.981	98.126	0.16	0.17	2.27	79	-0.04	1.80	78	-3.3	78	0.080	100	100	0.2	0.0	287	221	213	113	182	203	477	154	83	65	85	65	74	-0.009	5.03	0.58
565	93.146	98.299	0.17	0.17	2.27	79	0.39	1.80	78	-3.2	78	0.080	101	100	0.2	0.0	287	221	213	113	182	203	477	154	82	65	85	65	74	-0.009	5.02	0.57
566	93.311	98.473	0.17	0.17	2.25	79	0.28	1.80	78	-3.5	79	0.080	101	101	0.2	0.0	287	221	213	113	182	203	475	153	82	65	85	65	74	-0.009	4.96	0.56
567	93.475	98.647	0.16	0.17	2.26	79	0.12	1.80	78	-3.4	78	0.080	100	100	0.2	0.0	287	221	213	112	181	203	474	154	82	65	85	65	74	-0.009	4.94	0.56
568	93.640	98.821	0.17	0.17	2.26	79	0	1.80	78	-3.3	79	0.080	101	101	0.1	0.0	287	220	213	112	181	203	480	153	82	65	85	65	74	-0.009	4.93	0.56
569	93.805	98.995	0.17	0.17	2.27	79	0.32	1.80	78	-3.2	78	0.080	101	100	0.1	0.0	288	220	213	112	181	203	478	153	82	65	85	65	74	-0.009	4.83	0.59
570	93.969	99.169	0.16	0.17	2.25	79	0.43	1.80	78	-3.3	78	0.080	100	100	0.1	0.0	287	220	213	112	181	203	477	153	82	65	84	65	73	-0.009	4.74	0.64
571	94.133	99.342	0.16	0.17	2.26	79	0.41	1.81	78	-3.3	78	0.080	100	100	0.1	0.0	288	220	213	112	181	203	474	153	82	65	84	65	74	-0.009	4.71	0.64
572	94.298	99.517	0.17	0.17	2.27	79	-0.01	1.80	78	-3.2	78	0.080	101	101	0.1	0.0	287	220	213	112	180	202	475	152	82	65	84	65	74	-0.009	4.65	0.62
573	94.463	99.690	0.16	0.17	2.26	79	0.2	1.80	78	-3.2	78	0.080	101	100	0.1	0.0	287	220	213	112	180	202	475	152	82	65	84	65	74	-0.009	4.6	0.61
574	94.627	99.865	0.16	0.17	2.26	79	-0.08	1.80	78	-3.2	78	0.080	100	101	0.1	0.0	287	220	213	112	180	202	474	152	82	65	84	65	74	-0.009	4.54	0.59
575	94.791	100.038	0.16	0.17	2.27	79	0.25	1.81	78	-3.4	78	0.080	100	100	0.1	0.0	287	219	213	112	180	202	469	152	83	65	84	65	73	-0.009	4.52	0.58
576	94.956	100.212	0.17	0.17	2.27	79	0.35	1.79	78	-3.4	78	0.090	95	95	0.1	0.0	286	219	213	112	180	202	465	151	83	65	85	65	73	-0.009	4.49	0.58
577	95.121	100.386	0.16	0.17	2.24	79	0.42	1.79	78	-3.5	78	0.080	101	100	0.1	0.0	287	219	213	112	180	202	463	151	83	65	85	65	74	-0.009	4.41	0.57
578	95.285	100.560	0.16	0.17	2.26	79	-0.11	1.81	78	-3.5	78	0.090	94	95	0.1	0.0	286	219	213	111	180	202	462	151	83	65	85	66	73	-0.009	4.36	0.56
579	95.450	100.734	0.17	0.17	2.27	79	0.34	1.80	78	-3.5	78	0.080	101	100	0.1	0.0	286	218	213	111	179	201	460	151	82	65	85	66	73	-0.009	4.29	0.55
580	95.615	100.907	0.16	0.17	2.27	79	-0.05	1.79	78	-3.4	79	0.090	95	94	0.1	0.0	285	218	213	111	179	201	459	151	82	65	85	66	74	-0.009	4.27	0.55
581	95.779	101.082	0.16	0.17	2.25	79	-0.01	1.79	78	-3.2	78	0.080	100	101	0.1	0.0	285	217	213	111	179	201	457	150	82	65	85	65	74	-0.009	4.28	0.55
582	95.943	101.255	0.16	0.17	2.27	79	0.42	1.81	78	-3.4	78	0.090	94	94	0.1	0.0	284	217	212	111	179	201	456	150	82	65	84	65	74	-0.009	4.26	0.54
583	96.107	101.430	0.16	0.18	2.27	79	0.29	1.80	78	-3.2	78	0.090	94	95	0.1	0.0	283	217	212	111	179	200	454	150	82	65	84	66	74	-0.009	4.24	0.56
584	96.272	101.603	0.17	0.17	2.26	79	0.38	1.79	78	-3.2	78	0.080	101	100	0.0	-0.1	283	216	212	111	179	200	451	149	82	65	84	66	73	-0.009	4.23	0.57
585	96.437	101.777	0.16	0.17	2.26	79	0.13	1.80	78	-3.4	78	0.080	101	100	0.0	0.0	283	216	212	111	179	200	449	149	82	65	84	66	74	-0.009	4.21	0.56
586	96.601	101.951	0.16	0.17	2.27	79	-0.05	1.81	78	-3.5	78	0.080	100	100	0.0	0.0	282	216	212	111	178	200	449	149	82	65	84	66	74	-0.009	4.19	0.55
Avg/Tot	96.601	101.951	0.16	0.17	2.26	81		1.79	80		88	0.082	100	100								149.6				59	85	59	76	-0.022		

Wood Heater Lab Data

Manufacturer: Hearth & Home
Model: Dauntless NC
Tracking No.: 2389
Project No.: 061WS104E
Run #: 4
Date: 10/5/19

Equipment Numbers:

TRAIN 1 (First Hour emissions)

Sample Component	Reagent	Filter, Probe or Dish #	Weights		
			Final, mg	Tare, mg	Particulate, mg
B. Front filter catch	Filter	T212S	94.4	90.5	3.9
C. Rear filter catch	Filter				0.0
D. Probe catch*	Probe				0.0
E. Filter seals catch*	Seals				0.0

Sub-Total Total Particulate, mg: 3.9

TRAIN 1 (Post First Hour Change-out)

Sample Component	Reagent	Filter, Probe or Dish #	Weights		
			Final, mg	Tare, mg	Particulate, mg
B. Front filter catch	Filter	T205AP	184.2	183.1	1.1
C. Rear filter catch	Filter				0.0
D. Probe catch*	Probe	64	118206.9	118206.8	0.1
E. Filter seals catch*	Seals	R891	3386.7	3386.5	0.2

Sub-Total Total Particulate, mg: 1.4

Train 1 Aggregate Total Particulate, mg: **5.3**

TRAIN 2

Sample Component	Reagent	Filter, Probe or Dish #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Front filter catch	Filter	T205BP	186.0	181.4	4.6
B. Rear filter catch	Filter				0.0
C. Probe catch*	Probe	65	117084.2	117084.3	0.0
D. Filter seals catch*	Seals	R892	3294.9	3294.8	0.1

Total Particulate, mg: **4.7**

AMBIENT

Sample Component	Reagent	Filter # or Probe #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Front filter catch*	Filter				0.0

Total Particulate, mg: **0.0**

*Particulate catch that results in a negative number, is assumed to be zero for probes and seals, negative numbers for filters are assumed to be part of the seal weight.

Component	Equations:
A. Front filter catch	Final (mg) - Tare (mg) = Particulate, mg
B. Rear filter catch	Final (mg) - Tare (mg) = Particulate, mg
C. Probe catch	Final (mg) - Tare (mg) = Particulate, mg

Technician Signature:

OMNI-Test Laboratories, Inc.

Wood Heater Test Results

Manufacturer: Hearth & Home
Model: Dauntless NC
Project No.: 061WS104E
Tracking No.: 2389
Run: 4
Test Date: 10/05/19

Burn Rate	**0.82 kg/hr dry**
Average Tunnel Temperature	88 degrees Fahrenheit
Average Gas Velocity in Dilution Tunnel - vs	18.88 feet/second
Average Gas Flow Rate in Dilution Tunnel - Qsd	12551.2 dscf/hour
Average Delta p	0.082 inches H20
Total Time of Test	586 minutes

	AMBIENT	SAMPLE TRAIN 1	SAMPLE TRAIN 2	FIRST HOUR FILTER (TRAIN 1)
Total Sample Volume - Vm	0.000 cubic feet	96.601 cubic feet	101.951 cubic feet	9.806 cubic feet
Average Gas Meter Temperature	76 degrees Fahrenheit	81 degrees Fahrenheit	80 degrees Fahrenheit	83 degrees Fahrenheit
Total Sample Volume (Standard Conditions) - Vmstd	0.000 dscf	93.673 dscf	98.668 dscf	9.477 dscf
Total Particulates - m_n	0 mg	5.3 mg	4.7 mg	3.9 mg
Particulate Concentration (dry-standard) - C_f/C_s	0.000000 grams/dscf	0.00006 grams/dscf	0.00005 grams/dscf	0.00041 grams/dscf
Total Particulate Emissions - E_T	0.00 grams	6.94 grams	5.84 grams	5.17 grams
Particulate Emission Rate	0.00 grams/hour	0.71 grams/hour	0.60 grams/hour	5.17 grams/hour
Emissions Factor		0.87 g/kg	0.73 g/kg	2.55 g/kg
Difference from Average Total Particulate Emissions		0.55 grams	0.55 grams	
		Dual Train Comparison Results Are Acceptable		

FINAL AVERAGE RESULTS

Complete Test Run	
Total Particulate Emissions - E_T	6.39 grams
Particulate Emission Rate	**0.65 grams/hour**
Emissions Factor	0.80 grams/kg
First Hour Emissions	
Total Particulate Emissions - E_T	5.17 grams
Particulate Emission Rate	5.17 grams/hour
Emissions Factor	2.55 grams/kg
7.5% of Average Total Particulate Emissions	0.48 grams

QUALITY CHECKS

Filter Temps < 90 °F	OK
Filter Face Velocity (47 mm)	OK
Dryer Exit Temp < 80F	OK
Leakage Rate	OK
Ambient Temp (55-90°F)	OK
Negative Probe Weight Eval.	OK
Pro-Rate Variation	OK
Train A - Train B G/KG ≤ 0.5	0.14
Total PM Precision (%)	8.58

Technician Signature: _____

Wood Heater Efficiency Results - CSA B415.1

Manufacturer: Hearth & Home
Model: Dauntless NC
Date: 10/05/19
Run: 4
Control #: 061WS104E
Test Duration: 586
Output Category: II

Technician Signature: 

Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
Overall Efficiency	79.1%	84.6%
Combustion Efficiency	96.0%	96.0%
Heat Transfer Efficiency	82%	88.1%

Output Rate (kJ/h)	12,916	12,252	**(Btu/h)**
Burn Rate (kg/h)	0.82	1.80	**(lb/h)**
Input (kJ/h)	16,329	15,490	**(Btu/h)**

Test Load Weight (dry kg)	7.99	17.61	**dry lb**
MC wet (%)	18.58445506		
MC dry (%)	22.83		
Particulate (g)	0.65		
CO (g)	469		
Test Duration (h)	9.77		

Emissions	**Particulate**	**CO**
g/MJ Output	0.01	3.72
g/kg Dry Fuel	0.08	58.69
g/h	0.07	48.02
lb/MM Btu Output	0.01	8.64

Air/Fuel Ratio (A/F)	12.79

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

Adjunct to ASTM E XXXX Wood Heater Cordwood Test Method - May 10, 2017 Version
Cordwood Fuel Load Calculators - 12 lb/ft^3 Nominal Load Density
Core 45-65% of Total Load Weight, Remainder 35-55% of Total Load Weight
Values to be input manually

For Usable Firebox Volumes up to 3.0 ft^3 - Low and Medium Fire

Nominal Required Load Density (wet basis)	12	lb/ft^3				
Usable Firebox Volume	1.82	ft^3				
Total Nom. Load Wt. Target	21.84	lb				
Total Load Wt. Allowable Range	20.75	to	22.93	lb		
Core Target Wt. Allowable Range	9.828	to	14.20	lb		
Remainder Load Wt. Allowable Range	7.64	to	12.01	lb		
						Mid-Point
Core Load Fuel Pc. Wt. Allowable Range	3.28	to	5.46	lb		4.37
Remainder Load Pc. Wt. Allowable Range	2.18	to	6.55	lb		4.37
	Pc. #					
Core Load Piece Wt. Actual	1	4.54	lb	In Range		
	2	4.68	lb	In Range		
	3	4.41	lb	In Range		
Core Load Total. Wt. Actual		13.63	lb	In Range		
	Pc. #					
Remainder Load Piece Wt.	1	5.46	lb	In Range		
(2 or 3 Pcs.)	2	2.54	lb	In Range		
	3		lb	NA		
Remainder Load Piece Weight Ratio - Small/Large		47%		In Range		≤ 67%
Remainder Load Tot. Wt. Act		8.00	lb	In Range		
Total Load Wt. Actual		21.63	lb	In Range		
Core % of Total Wt.		63%		In Range		45-65%
Remainder % of Total Wt.		37%		In Range		35-55%
Actual Load % of Nominal Target		99%		In Range		95-105%
Actual Fuel Load Density		11.9	lb/ft^3			
Allowable Charcoal Bed Wt. Range (lb)	2.2	to	4.3			Mid-Point
Actual Charcoal Bed Wt.		2.5	lb	In Range		3.2
Actual Fuel Load Ending Wt.		0.0	lb	Valid Test		≥ 90%
Total Wt. of Fuel Burned During Test Run lb.		21.6	lb			

Fuel Piece Moisture Reading (%-dry basis)

1	2	3	Ave.		Pc. Wt. Dry Basis			
22.3	24.8	22.6	23.2	In Range	3.68	lb	1.67	kg
22.4	18.2	20.8	20.5	In Range	3.88	lb	1.76	kg
24.3	24.6	22.3	23.7	In Range	3.56	lb	1.62	kg
20.4	23	23.4	22.3	In Range	4.47	lb	2.03	kg
22.4	25.5	25.4	24.4	In Range	2.04	lb	0.93	kg
			NA	NA	NA	lb	NA	kg

Total Load Ave. MC % (dry basis)	22.6	In Range			
Total Load Ave. MC % (wet basis)	18.4				
Total Test Load Weight (dry basis) →			17.64	lb	8.00 kg
Total Fuel Weight Burned During Test Run (dry basis)			17.6	lb	8.00 kg

OMNI-Test Laboratories, Inc.

Wood Heater Run Sheets

Client: Hearth & Home Project Number: 0061WS104E Run Number: 4
Model: Dauntless-Flexburn w/c Tracking Number: 2389 Date: 10/5/19
Test Crew: B Dukes
OMNI Equipment ID numbers:

Wood Heater Run Notes

Air Control Settings

Primary: 2 "clicks" from full closed

Secondary: fixed

Tertiary/Pilot: N/A

Fan: On Medium

Preburn Notes

Time	Notes
N/A	

Test Notes

Sketch test fuel configuration: See photo

Start up procedures & Timeline:

Bypass: open for 50 seconds then closed
Fuel loaded by: 50 seconds
Door closed at: 60 seconds
Primary air: At test setting entire test

Notes: Fan on medium entire test

Time	Notes
60	Changed front filter in Train A

Technician Signature: B Dukes Date: 11/11/19

OMNI-Test Laboratories, Inc.

Wood Heater Run Sheets

Client: Hearth & Home Project Number: 0061WS104E Run Number: 4
Model: Dauntless-Flexburn NC Tracking Number: 2389 Date: 10/5/19
Test Crew: BDges
OMNI Equipment ID numbers:

Wood Heater Supplemental Data

Start Time: 12:41 Booth #:
Stop Time:

Stack Gas Leak Check:
Initial: good Final: good

Sample Train Leak Check:
A: 0.0 @ 6 "Hg
B: 0.0 @ 10 "Hg

Calibrations: Span Gas CO_2: 15.0 CO: 2.0

	Pre Test		Post Test	
	Zero	Span	Zero	Span
Time	see start of Run		2245	2245
CO_2		3	0.03	14.96
CO			-0.00	1.98

Air Velocity (ft/min): Initial: 250 Final: 250
Scale Audit (lbs): Initial: 10.0 Final: 10.0
Pitot Tube Leak Test: Initial: good Final: good
Stack Diameter (in): 6"
Induced Draft: 0.0
% Smoke Capture: 100%
Flue Pipe Cleaned Prior to First Test in Series:
Date: 9/30/19 Initials: ac

	Initial	Middle	Ending
P_b (in/Hg)	29.87		29.78
RH (%)	27		29
Ambient (°F)	81		74

Tunnel Traverse

Microtector Reading	dP (in H_2O)	T(°F)
	.074	79
	.082	79
	.084	79
	.080	79
	.074	79
	.084	79
	.084	79
	.076	79
Center:		
	.084	79

Tunnel Static Pressure (in H_2O):	
Beginning of Test	End of Test
-.282	-.282

Background Filter Volume: N/A

Technician Signature: Date: 11/7/19

Section 4

Quality Assurance/Quality Control

QUALITY ASSURANCE/QUALITY CONTROL

OMNI follows the guidelines of ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories," and the quality assurance/quality control (QA/QC) procedures found in *OMNI*'s Quality Assurance Manual.

OMNI's scope of accreditation includes, but is not limited to, the following:

- ANSI (American National Standards Institute) for certification of product to safety standards.
- To perform product safety testing by the International Accreditation Service, Inc. (formerly ICBO ES) under accreditation as a testing laboratory designated TL-130.
- To perform product safety testing as a "Certification Organization" by the Standards Council of Canada (SCC).
- Serving as a testing laboratory for the certification of wood heaters by the U.S. Environmental Protection Agency.

This report is issued within the scope of *OMNI*'s accreditation. Accreditation certificates are available upon request.

The manufacturing facilities and quality control system for the production of the Dauntless FlexBurn at Hearth and Home Technologies were evaluated to determine if sufficient to maintain conformance with OMNI's requirements for product certification. OMNI has concluded that the manufacturing facilities, processes, and quality control system are adequate to produce the appliance congruous with the standards and model codes to which it was evaluated.

Sample Analysis

Analysis Worksheets
Tared Filter, Probe, and O-Ring Data

OMNI-Test Laboratories, Inc.

Wood Heater Run Sheets

Client: Hearth & Home Project Number: 0061WS104E Run Number: 1
Model: Dauntless-Flexburn NC Tracking Number: 2389 Date: 10/4/19
Test Crew: B Davis
OMNI Equipment ID numbers: 637, 592, 283A

ASTM E2515 Lab Sheet

Assembled By:

B Davis

Date/Time in Dessicator:

10/8/19 0910

	Weighing #1	Weighing #2	Weighing #3	Weighing #4	Weighing #5
Date/Time:	10/9/19 1010	10/10/19 0905	10/11/19 0819	10/15/19 0815	
R/H %:	19.8	21.4	20.7	20.3	
Temp:	71.3	70.9	72.5	71.0	
200 mg Audit:	200.1	200.1	200.1	200.1	
2 g Audit:	2000.3	2000.3	2000.3	2000.1	
100 g Audit	99997.5	99997.8	99997.8	99997.9	
Initials:	BL	BL	BL	BL	

Train	Element	ID #	Tare (mg)	Weight (mg)	Weight (mg)	Weight (mg)	Weight (mg)	Weight (mg)
A (First Hour)	Front Filter	T1835	87.1	92.3	92.2			
	Rear Filter							
	Probe							
	O-Ring Set							
A (Remainder)	Front Filter	T203AP	179.6	180.0	180.1			
	Rear Filter							
	Probe	36	114883.6	114883.8	114883.8			
	O-Ring Set	R887	3487.0	3489.2	3488.7	3488.0	3487.9	
B	Front Filter	T203BP	180.0	183.5	183.7			
	Rear Filter	T1845	87.5	90.9	90.9			
	Probe	56	118613.2	118613.8	118613.5	118613.7		
	O-Ring Set	R888	3334.1	3336.0	3335.1	3334.1	3334.2	
BG	Filter							

Technician Signature: [signature] Date: 10/11/19

OMNI-Test Laboratories, Inc.

Wood Heater Run Sheets

Client: Hearth & Home Project Number: 0061WS104E Run Number: 3
Model: Dauntless-Flexburn NC Tracking Number: 2389 Date: 10/4/19
Test Crew:
OMNI Equipment ID numbers: 637, 592, 203A

ASTM E2515 Lab Sheet

Assembled By:

B Davis

Date/Time in Dessicator:

10/8/19 0910

	Weighing #1	Weighing #2	Weighing #3	Weighing #4	Weighing #5
	Date/Time: 10/9/19 1010	Date/Time: 10/10/19 0905	Date/Time: 10/11/19 0919	Date/Time: 10/15/19 0915	Date/Time:
	R/H %: 19.8	R/H %: 21.4	R/H %: 20.7	R/H %:	R/H %:
	Temp: 71.3	Temp: 70.9	Temp: 72.5	Temp:	Temp:
	200 mg Audit: 200.1	200 mg Audit: 200.1	200 mg Audit: 200.1	200 mg Audit:	200 mg Audit:
	2 g Audit: 2000.3	2 g Audit: 2000.3	2 g Audit: 2000.3	2 g Audit:	2 g Audit:
	100 g Audit: 99997.5	100 g Audit 99997.8	100 g Audit 99997.8	100 g Audit	100 g Audit
	Initials: BD	Initials: DA	Initials: BD	Initials:	Initials:

Train	Element	ID #	Tare (mg)	Weight (mg)	Weight (mg)	Weight (mg)	Weight (mg)	Weight (mg)
A (First Hour)	Front Filter	T211S	90.6	90.8	90.8 ✓			
	Rear Filter							
	Probe							
	O-Ring Set							
A (Remainder)	Front Filter	T204AF	181.6	183.3	183.3 ✓			
	Rear Filter							
	Probe	62	117660.9	117661.0	117660.9 ✓			
	O-Ring Set	R889	3295.1	3295.9	3295.2	3295.1 ✓		
B	Front Filter	T204BF	183.4	185.4	185.6 ✓			
	Rear Filter							
	Probe	66	118455.0	118455.1	118455.0 ✓			
	O-Ring Set	R890	3368.8	3370.2	3369.1	3368.9 ✓		
BG	Filter							

Technician Signature: [signature] Date: 10/11/19

OMNI-Test Laboratories, Inc.

Wood Heater Run Sheets

Client: Hearth & Home | Project Number: 0061WS104E | Run Number: 4
Model: Dauntless-Flexburn N/C | Tracking Number: 2389 | Date: 10/5/19
Test Crew: B Davis
OMNI Equipment ID numbers: 637, 592, 243A

ASTM E2515 Lab Sheet

Assembled By:

B Davis

Date/Time in Dessicator:

10/8/19 910

	Weighing #1	Weighing #2	Weighing #3	Weighing #4	Weighing #5
	Date/Time: 10/8/19 1010	Date/Time: 10/10/19 0905	Date/Time: 10/11/19 0819	Date/Time: 10/15/19 0815	Date/Time:
	R/H %: 19.8	R/H %: 21.4	R/H %: 20.7	R/H %: 20.3	R/H %:
	Temp: 71.3	Temp: 70.9	Temp: 72.5	Temp: 71.0	Temp:
	200 mg Audit: 200.1	200 mg Audit: 200.1	200 mg Audit: 200.1	200 mg Audit: 200.1	200 mg Audit:
	2 g Audit: 2000.3	2 g Audit: 2000.3	2 g Audit: 2000.3	2 g Audit: 2000.1	2 g Audit:
	100 g Audit: 99997.5	100 g Audit 99997.8	100 g Audit 99997.8	100 g Audit 99997.9	100 g Audit
	Initials: BL	Initials: BL	Initials: BL	Initials: BL	Initials:

Train	Element	ID #	Tare (mg)	Weight (mg)	Weight (mg)	Weight (mg)	Weight (mg)	Weight (mg)
A (First Hour)	Front Filter	T212S	90.5	94.3	94.4 ✓			
	Rear Filter							
	Probe							
	O-Ring Set							
A (Remainder)	Front Filter	T205AP	183.1	184.3	184.2 ✓			
	Rear Filter							
	Probe	64	118206.8	118206.8	118206.9 ✓			
	O-Ring Set	R891	3386.5	3387.8	3387.0	3386.6	3386.7 ✓	
B	Front Filter	T205BP	181.4	185.9	186.0 ✓			
	Rear Filter							
	Probe	65	117084.3	117084.2	117084.2 ✓			
	O-Ring Set	R892	3294.8	3295.5	3294.9	3294.9 ✓		
BG	Filter							

Technician Signature: [signature] Date: 10/11/19

Tare Sheet: (check one) **Probes** ✓ **47mm Filters**_____ **100mm Filters**_____ **O-Ring Pair**_____

Prepared By: B Davis Balance ID #: omni - 00637 Thermohygrometer ID #: omni - 00592 Audit Weight ID #/Mass: omni - 002824 / 100 g

Placed in Dessicator: Date: 9/24/19 Time: 0815 ID #	Date: 9/25/19 Time: 1040 RH %: 21.9 T (°F): 75.5 Audit: 99997.8	Date: 9/26/19 Time: 0858 RH %: 25.0 T (°F): 73.9 Audit: 99998.0	Date: 9/27/19 Time: 08:12 RH %: 23.6 T (°F): 71.7 Audit: 99997.9	Date: Time: RH %: T (°F): Audit:	Date Used	Project Number	Run No.
2	115016.0	115016.0 ✓					
6	115349.3	115349.3 ✓					
7	114981.6	114981.8 ✓					
15	114341.4	114341.5 ✓					
30	114328.2	114328.4 ✓					
53	118273.0	118273.2 ✓					
56	118613.1	118613.2 ✓			10/4/19	00GINS104.E MC	1
36	114883.4	114883.6 ✓					↓
62	117660.9	117660.9 ✓					2
66	118454.9	118455.0 ✓					↓
64	118206.7	118206.8 ✓			10/5/19		4
65	117084.1	117084.3 ✓			↓	↓	↓
67	117758.0	117758.3 ✓	117758.1 ✓				
68	116804.1	116804.3 ✓					
	Initials: BA	Initials: TT	Initials: TT	Initials:			

Final Technician Signature: _____ Date: 9/26/19 Evaluator signature: _____

Control No. P-SFDP-0002.xls, Effective date: 2/1/2017

Tare Sheet: (check one) Probes_____ 47mm Filters ✓ 100mm Filters_____ O-Ring Pair_____

Prepared By: BDAVIS Balance ID #: OMNI-00637 Thermohygrometer ID #: OMN.-00592 Audit Weight ID #/Mass: OMNI 282A / 200 mg

Placed in Dessicator: Date: 9/23/19 Time: 0825 ID #	Date: 9/24/19 Time: 0900 RH %: 17.9 T (°F): 75.5 Audit: 200.1	Date: 9/25/19 Time: 10:03 RH %: 21.2 T (°F): 73.4 Audit: 200.0	Date: 9/26/19 Time: 10:13 RH %: 25.0 T (°F): 73.9 Audit: 200.1	Date: Time: RH %: T (°F): Audit:	Date Used	Project Number	Run No.
T200AP	179.1	179.1 ✓					
T200BP	180.1	180.1 ✓					
T201AP	177.6	177.4 ✓					
T201BP	177.7	177.4	177.6 ✓				
T202AP	178.6	178.3	178.3 ✓				
T202BP	180.8	180.4	180.6 ✓				
T203AP	179.8	179.6 ✓			10/4/19	006/WS104E NC	1
T203BP	180.3	180.0	180.0 ✓		↓	↓	↓
T204AP	182.1	181.8	181.6 ✓				2
T204BP	183.7	183.4	183.4 ✓		↓	↓	↓
T205AP	183.2	183.1 ✓			10/5/19		4
T205BP	181.6	181.4 ✓			↓	↓	↓
T206AP	181.5	181.1	181.3 ✓				
T206BP	182.2	182.0 ✓					
T207AP	179.5	179.1	179.1 ✓				
T207BP	179.7	179.3	179.2 ✓				
T208AP	180.1	179.8	180.0 ✓				
T208BP	179.2	178.9	179.1 ✓				
T209AP	178.5	178.2	178.4 ✓				
T209BP	178.8	178.4	178.5 ✓				
	Initials: BL	Initials: BL	Initials: TT	Initials:			

Final Technician Signature: _____ Date: 9/26/19 Evaluator signature: _____

Tare Sheet: (check one) **Probes**_____ **47mm Filters**_✓_ **100mm Filters**_____ **O-Ring Pair**_____

Prepared By: BDavis Balance ID #: Omni.-00637 Thermohygrometer ID #: Omni.-00592 Audit Weight ID #/Mass: Omni-002384 / 200 g

Placed in Dessicator: Date: 9/23/17 Time: 0825 ID #	Date: 9/24/17 Time: 0900 RH %: 17.7 T (°F): 75.5 Audit: 200.1	Date: 9/25/17 Time: 10:03 RH %: 21.2 T (°F): 73.4 Audit: 200.0	Date: 9/26/17 Time: 10:13 RH %: 25.0 T (°F): 73.9 Audit: 200.1	Date: Time: RH %: T (°F): Audit:	Date Used	Project Number	Run No.
T211S	90.5	90.6	✓		10/4/17	004WS104E	2
T212S	90.5	90.5	✓		10/5/17		4
T213S	91.3	91.0	91.0 ✓				
T214S	90.0	89.8	✓				
T215S	88.4	88.4	✓				
T216S	89.8	89.7	✓				
T217S	88.4	88.2	✓				
T218S	89.0	88.9	✓				
T219S	89.0	88.9	✓				
T220S	91.5	91.3	✓				
	Initials: BD	Initials: BD	Initials: TT	Initials:			

Final Technician Signature: BD Date: 9/26/17 Evaluator signature: M. Morgan

Control No. P-SFDP-0002.xls, Effective date: 2/1/2017

Tare Sheet: (check one) **Probes**_____ **47mm Filters**_✓_ **100mm Filters**_____ **O-Ring Pair**_____

Prepared By: BDAV Balance ID #: omni-00637 Thermohygrometer ID #: omni-00392 Audit Weight ID #/Mass: omni-002834 / 200 mg

Placed in Dessicator: Date: 6/27/19 Time: 1210 ID #	Date: 6-28-19 Time: 14:40 RH %: 24 T (°F): 73.6 Audit: 200.0	Date: 6/29/19 Time: 08:00 RH %: 32 T (°F): 72.8 Audit: 200.1	Date: Time: RH %: T (°F): Audit:	Date: Time: RH %: T (°F): Audit:	Date Used	Project Number	Run No.
T170AP	IK ~~83.7~~ 166.0	166.1					
T170BP	165.5	165.4					
T171AP	166.4	166.3					
T171BP	167.4	167.3					
T172AP	166.8	166.9					
T172BP	167.3	167.4					
T173AP	167.1	167.0					
T173BP	167.5	167.6					
T174AP	167.8	167.6					
T174BP	167.5	167.5					
T175S	84.2	84.3					
T176S	84.0	84.0					
T177S	84.5	84.4					
T178S	83.8	83.8					
T179S	86.0	86.1					
T180S	86.8	86.7					
T181S	86.8	86.9					
T182S	87.2	87.1					
T183S	87.1	87.1			10/4/19	0061405164F NC	1
T184S	87.5	87.5					
	Initials: IK	Initials: IK	Initials:	Initials:			

Final Technician Signature: _____ Date: 6/27/19 Evaluator signature: _____

Tare Sheet: (check one) Probes_____ 47mm Filters_____ 100mm Filters_____ O-Ring Pair ✓

Prepared By: B Davis Balance ID #: Omni-0637 Thermohygrometer ID #: Omni-0592 Audit Weight ID #/Mass: Omni-2834 1 g

Placed in Dessicator: Date: 9/20/19 Time: 0815 ID #	Date: 9/23/19 Time: 0920 RH %: 27.9 T (°F): 74.6 Audit: 5000.0 ~~2000.1~~	Date: 9/24/19 Time: 0950 RH %: 17.9 T (°F): 75.5 Audit: 5000.1	Date: 9/25/19 Time: 10:03 RH %: 21.2 T (°F): 73.4 Audit: 5000.0	Date: Time: RH %: T (°F): Audit:	Date Used	Project Number	Run No.
R881	3514.1	3513.6	3513.6 ✓		10/2/19	006/WS104E	1
R882	4282.2	4281.9	4281.8 ✓		↓	↓	↓
R883	3544.8	3544.3	3544.4 ✓		10/2/19		2
R884	3569.4	3568.8	3568.8 ✓		↓		↓
R885	3532.3	3532.0	3532.1 ✓		10/3/19		4
R886	3501.1	3500.6	3500.6 ✓		↓		↓
R887	3487.4	3487.1	3487.0 ✓		10/4/19	006/WS104E RC	1
R888	3334.4	3333.9	3334.1 ✓		↓	↓	↓
R889	3295.2	3295.1 ✓			↓	↓	2
R890	3368.9	3368.8 ✓			↓	↓	↓
R891	3386.6	3386.3	3386.5 ✓		10/5/19		4
R892	3294.8	3294.8 ✓			↓	↓	↓
R893	4155.8	4155.8 ✓			10/8/19	0117WB038E	3
R894	3364.5	3364.4 ✓			↓		↓
R895	4102.7	4102.6 ✓					
R896	3330.4	3330.2 ✓					
R897	3402.0	3402.1 ✓			10/17/19	0117WB038E	5
R898	3322.4	3322.5 ✓			↓	↓	↓
R899	3310.5	3310.6 ✓					
R900	3421.7	3421.8 ✓					
	Initials: BC	Initials: BC	Initials: BM	Initials:			

Final Technician Signature: _____ Date: 9/25/19 Evaluator signature: _____

Calibrations

Methods EPA 28R, ASTM E2515, ASTM E3053

ID #	Lab Name/Purpose	Log Name	Attachment Type
132	10 lb Weight	Weight Standard, 10 lb.	Calibration Certificate
82919	Platform Scale	Digital Floor – GSE 350	Calibration Certificate
650	Digital Barometer	Traceable Barometer	Calibration Certificate
283A	Audit Weights	Troemner 21pc Msas Set	Calibration Certificate
371	Sample Box / Dry Gas Meter	Apex Automated Emissions Sampling Box	Calibration Log
372	Sample Box / Dry Gas Meter	Apex Automated Emissions Sampling Box	Calibration Log
410	Microtector	Dwyer Microtector	Calibration Certificate
559	Vaneometer	Dwyer Vaneometer	Equipment Record
592	Thermohygrometer	Omega Digital Thermohygrometer	Calibration Log
420	Combustion Gas Analyzer	CAI Gas Analyzer	See Run Sheet
637	Milligram Balance	Analytical Balance - Mettler - Toledo	Calibration Certificate

SCALE WEIGHT CALIBRATION DATA SHEET

Weight to be calibrated: 10 pounds

ID Number: OMNI-00132

Standard Calibration Weight: 10 pounds

ID Number: OMNI-00255

Scale Used: MTW-150K

ID Number: OMNI-00353

Date: 2/23/2018 By: B. Davis

Standard Weight (A) (Lb.)	Weight Verified (B) (Lb.)	Difference (A - B)	% Error
10.0	10.0	0.0	0

*Acceptable tolerance is 1%.

This calibration is traceable to NIST using calibrated standard weights.

Technician signature: _____ Date: 2/23/18

FARNHAM'S SCALE SYSTEMS

PO Box 450; 289 VT-64
Williamstown, VT 05679
802-433-6000

SCALE INSPECTION AND TEST REPORT

cindy@farnhamscales.com

CUSTOMER: VT Castings
ADDRESS: VT Casting Road - Bethal VT

SCALE #	SCALE LOCATION
MAKE-MODEL	SERIAL NUMBER
GSE 350	
SCALE TYPE	
Digital Floor	
SCALE CAPACITY	
700 x .05 LBs	

CORNER TESTS

WEIGHT USED	AS FOUND	AS LEFT
200 LBs	200.00	
	200.00	
	199.90	
	199.90	

(LB) OZ G KG

TEST RESULTS

VT ID#	TEST WT	AS FOUND	ERROR	AS LEFT	ERROR
	0	0	0		
	50	50.00	0		
	100	100.00	0		
	200	200.00	0		
	300	300.00	0		
	400	399.95	-.05		
	500	499.95	-.05		

REMARKS AND RECOMMENDATIONS

Scale is in tolerance

CALIBRATION TOLERANCE: +/- 3 Grads
1 Grad = .05 LBs

AS FOUND:	ACCEPT	REJECT
AS LEFT:	ACCEPT	REJECT

DUE DATE: 8-2020
COMPLETE DATE: 8-29-19
TECH 1: NF
TECH 2:

CUSTOMER SIGNATURE: X

22 Albiston Way
Auburn, ME 04210
800-292-6218
207-777-6218
Fax 207-777-6215
www.specair.com

Date: 09/05/2019

Certificate of Analysis

Customer:
HEARTH & HOME

Order #: 1613110

Results are reported in mole percent, unless otherwise indicated. Mixes are prepared via partial pressure methods, or gravimetrically, using high load high sensitivity electronic scales. Prior to use, scales are verified for accuracy using applicable NIST traceable weights; analyses are calibrated against reference materials traceable to NIST weights and/or NIST gas reference materials.

Cylinder Serial #: AS0720066 **Cylinder Size:** EC2 **CGA Connection:** 580 **Fill Pressure:** 2000 PSI

Analysis: Nitrogen Batch Analysis **Lot #:** 4924801

Component(s):	Requested Concentration(s):	Actual Concentration(s):
Oxygen	< 2 PPM	0.6 PPM
Moisture	< 3 PPM	0.4 PPM
THC	< 0.5 PPM	< 0.1 PPM

Expiration Date: 09/2022

Comments: MEETS OR EXCEEDS 99.999% ULTRA HIGH PURITY

Approved By:

Ron Abbott

22 Albiston Way
Auburn, ME 04210
800-292-6218
207-777-6218
Fax 207-777-6215
www.specair.com

Date: 09/05/2019

Certificate of Analysis

Customer:
HEARTH & HOME

Order #: 1613110

Results are reported in mole percent, unless otherwise indicated. Mixes are prepared via partial pressure methods, or gravimetrically, using high load high sensitivity electronic scales. Prior to use, scales are verified for accuracy using applicable NIST traceable weights; analyses are calibrated against reference materials traceable to NIST weights and/or NIST gas reference materials.

Cylinder Serial #: AS400477 **Cylinder Size:** EC2 **CGA Connection:** 350 **Fill Pressure:** 2000 PSI

Analysis: Certified Batch Analysis **Lot #:** 4924802

Component(s):	Requested Concentration(s):	Actual Concentration(s):
Carbon Monoxide	2%	2.0%
Carbon Dioxide	15%	15.0%
Nitrogen	BALANCE	BALANCE

Expiration Date: 09/2022

Approved By:

Ron Abbott J.

Ron Abbott

Certificate of Calibration

Certificate Number: **698278**

JJ Calibrations, Inc.
7007 SE Lake Rd
Portland, OR 97267-2105
Phone 503.786.3005
FAX 503.786.2994

Omni-Test Laboratories
13327 NE Airport Way
Portland, OR 97230

ACCREDITED
0723.01
Calibration

PO: **190231**
Order Date: 04/04/2019
Authorized By: **N/A**

Property #: OMNI-00650
User: N/A
Department: N/A
Make: Control Company
Model: 6530
Serial #: 181062211
Description: Thermohygrometer / Barometer
Procedure: 403406
Accuracy: ±3%RH, ±.4°C(0.8°F), ±4mbar(0.12inHg)

Calibrated on: 04/18/2019
*Recommended Due: 04/18/2020
Environment: 22 °C 53 % RH
* As Received: Within Tolerance
* As Returned: Within Tolerance
Action Taken: Calibrated
Technician: **146**

Remarks: * Many factors may cause the unit to drift out of calibration before the recommended due date. Any reported error is the absolute value between the reference and the unit. Uncertainties include the effects of the unit.

Standards Used

Std ID	Manufacturer	Model	Nomenclature	Due Date	Trace ID
847A	Fluke	RPM4	Reference Pressure Monitor	11/21/2019	688957
644A	Thunder Scientific	1200	Two Pressure Humidity Generator	07/30/2019	674006

Measurement Data

Parameter / Measurement Description	Range Unit	Reference	Min	Max	kError	UUT	Uncertainty Accredited = ✓
Before/After							
Humidity							
	%	13.0	10	16	1	14 %	5.8E-01 ✓
	%	50.0	47	53	2	48 %	5.8E-01 ✓
	%	80.0	77	83	3	77 %	5.8E-01 ✓
Temperature							
	°C	20.00	19.6	20.4	0.4	19.6 °C	8.1E-02 ✓
	°C	35.00	34.6	35.4	0.4	34.6 °C	8.1E-02 ✓
	°C	50.00	49.6	50.4	0.2	49.8 °C	8.1E-02 ✓
Barometer							
	29 inHg	29.6210	29.501	29.741	0.009	29.630 inHg	8.1E-02 ✓

JJ Calibrations, Inc. certifies that this instrument has been calibrated in accordance with the JJ Calibrations Quality Assurance Manual with the stated procedure using standards that are traceable to the National Institute of Standards and Technology (NIST), or other National Measurement Institutes (NMI's), or by using natural physical constants, intrinsic standards or ratio calibration techniques. The quality system and this certificate are in compliance with ANSI/NCSL Z540-1-1994, ISO/IEC 17025-2005, ISO 10012-1, the ISO 9000 family and QS 9000. The expanded uncertainties of measurements for this calibration are based upon 95% (2 sigma) confidence limits. Unless otherwise stated, a test accuracy ratio (TAR) of 4:1, if achievable, is maintained. The results reported herein apply only to the calibration of the item described above. This report may not be reproduced, except in full, without prior written consent of JJ Calibrations, Inc.
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Reviewer

3 Issued 04/19/2019 Rev # 15

Inspector

Certificate of Calibration

Certificate Number: **685888**

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Portland, OR 97267-2105
Phone 503.786.3005
FAX 503.786.2994

Omni-Test Laboratories
13327 NE Airport Way
Portland, OR 97230

A2LA ACCREDITED 0723.01 Calibration

PO: **180188**
Order Date: 10/09/2018
Authorized By: **N/A**

Property #: OMNI-00283A
User: N/A
Department: N/A
Make: Troemner Inc
Model: 1mg-100g (Class F)
Serial #: 47883
Description: Mass Set, 21pc
Procedure: DCN 500901
Accuracy: Class F

Calibrated on: 10/26/2018
*Recommended Due: 10/26/2023
Environment: 20 °C 57 % RH
* As Received: Within Tolerance
* As Returned: Within Tolerance
Action Taken: Calibrated
Technician: **139**

Remarks: * Many factors may cause the unit to drift out of calibration before the recommended due date. Any reported error is the absolute value between the reference and the unit. Uncertainties include the effects of the unit.

This set meets Class F specifications.
Received and returned eight (8) masses in a black case secured by a rubber band.

Standards Used

Std ID	Manufacturer	Model	Nomenclature	Due Date	Trace ID
723A	Rice Lake	1mg-200g (Class 0)	Mass Set,	03/23/2019	668240
800A	Sartorius	MSA225W100DI	Analytical Balance	12/11/2018	663857

Measurement Data

Parameter / Measurement Description	Range Unit	Reference	Min	Max	ᵏError	UUT	Uncertainty Accredited = ✓
Before/After							
Mass							
Dot	200 mg	200.00030	199.4603	200.5403	0.0500	200.0503 mg	6.2E-01 ✓
	1 g	1.00000880	0.9991088	1.0009088	0.0000000	1.0000088 g	1E-03 ✓
	2 g	2.00001470	1.9989147	2.0011147	0.0003250	2.0003397 g	1.3E-03 ✓
	5 g	5.00000840	4.9985084	5.0015084	0.0000400	4.9999684 g	1.7E-03 ✓
	10 g	10.0000100	9.998010	10.002010	0.000245	9.999765 g	2.3E-03 ✓
Dot	20 g	20.0000140	19.996014	20.004014	0.000990	20.001004 g	4.6E-03 ✓
	50 g	49.9999660	49.989966	50.009966	0.000595	49.999371 g	1.1E-02 ✓
	100 g	100.000000	99.98000	100.02000	0.00194	99.99806 g	2.3E-02 ✓

Reviewer

3 Issued 10/29/2018 Rev # 15

Inspector

Thermal Metering System Calibration
Y Factor

Manufacturer:	Apex
Model:	XC-60-EP
Serial Number:	0702003
OMNI Tracking No.:	OMNI-00371
Calibrated Orifice:	☐ Yes

Previous Calibration Comparision

Date	1/17/2019	Acceptable Deviation (5%)	Deviation
y Factor	1.009	0.05045	0.017
Acceptance	Acceptable		

Average Gas Meter y Factor	**Orifice Meter dH@**
0.992	**N/A**

Calibration Date:	07/02/19	
Calibrated by:	B. Davis	
Calibration Frequency:	6 months	
Next Calibration Due:	7/17/2019	
Instrument Range:	1.000	cfm
Standard Temp.:	68	oF
Standard Press.:	29.92	"Hg
Barometric Press., Pb:	30.2	"Hg
Signature/Date:		7/21/2017

Current Calibration

Acceptable y Deviation	0.020
Maximum y Deviation	0.005
Acceptable dH@ Deviation	N/A
Maximum dH@ Deviation	N/A
Acceptance	Acceptable

Reference Standard *			
Standard Calibrator	Model	Standard Test Meter	
	S/N	OMNI-00001	
	Calib. Date	18-Nov-18	
	Calib. Value	0.9981	y factor (ref)

Calibration Parameters	Run 1	Run 2	Run 3
Reference Meter Pressure ("H2O), Pr	0.00	0.00	0.00
DGM Pressure ("H2O), Pd	3.00	1.70	1.00
Initial Reference Meter	187.8	193	198.9
Final Reference Meter	192.9	198.8	204.505
Initial DGM	0	0	0
Final DGM	5.073	5.848	5.668
Temp. Ref. Meter (°F), Tr	72.5	72.1	72.5
Temperature DGM (°F), Td	73.0	74.0	75.0
Time (min)	26.8	47.1	52.1
Net Volume Ref. Meter, Vr	5.100	5.800	5.605
Net Volume DGM, Vd	5.073	5.848	5.668
Gas Meter y Factor =	**0.997**	**0.989**	**0.989**
Gas Meter y Factor Deviation (from avg.)	0.005	0.003	0.003
Orifice dH@	**N/A**	**N/A**	**N/A**
Orifice dH@ Deviation (from avg.)	N/A	N/A	N/A

where:

1. Deviation = |Average value for all runs - current run value|

** 2. y = [Vr x (y factor (ref)) x (Pb + (Pr/ 13.6)) x (Td + 460)]/ [Vd x (Pb + (Pd / 13.6)) x (Tr + 460)]

** 3. dH@ = 0.0317 x Pd / (Pb (Td + 460)) x [(Tr + 460) x time) / Vr]^2

* Reference calibration is traceable to NIST through NIST Test # 40674, Kimble ASTM E1272, or NIST traceable laboratory

** Equations come from EPA Method 5

The uncertainty of measurement is ±0.14 ft^3/min. This is based on the reference standard having a TAR (Test Accuracy Ratio) of at least 4:1.

Reviewed By 8/27/19

Temperature Calibration
EPA Method 28R, ASTM 2515

Booth:	Temperature Monitor Type:	Equipment Number:
Mobile	National Instruments Logger	00371, 00372

Reference Meter Equipment Number: 00373	Calibration Due Date: 8/02/17

Calibration Performed By:	Date:	Ambient Temperature:	Barometric Pressure:
B. Davis	7/02/19	74	30.21

Input Temperature (F)	Ambient	Meter A	Meter B	Filter A	Filter B	Tunnel	FB Interior
0	-1	0	0	0	-0	1	1
100	99	100	100	100	99	101	101
300	299	300	300	300	299	300	300
500	499	500	500	500	499	500	500
700	699	700	700	700	700	701	700
1000	999	1000	1000	1000	1000	1000	1000

Input (F)	FB Top	FB Bottom	FB Back	FB Left	FB Right	Imp A	Imp B	Cat	Stack
0	1	1	1	1	0	0	-0	0	1
100	101	101	101	101	101	100	100	100	101
300	300	300	300	300	300	299	299	299	301
500	500	500	500	500	501	499	499	499	501
700	700	700	700	700	700	699	699	699	700
1000	1001	1000	1001	1000	1001	1000	1000	1000	1001
1500								1499	
2000								1999	

Technician signature: _____ Date: 7/2/19

Reviewed By: _____ Date: 08/27/19

DIFFERENTIAL PRESSURE GAUGE CALIBRATION DATA SHEET

Instrument to be calibrated: Pressure Transducer

Maximum Range: 0-2" WC ID Number: OMNI-00371

Calibration Instrument: Digital Manometer ID Number: OMNI-00395

Date: 7/15/19 By: B. Davis

This form is to be used only in conjunction with Standard Procedure C-SPC.

Range of Calibration Point ("WC)	Digital Manometer Input ("WC)	Pressure Gauge Response ("WC)	Difference (Input - Response)	% Error of Full Span*
0-20% Max. Range 0 - 0.4	0.045	0.042	0.003	0.15
20-40% Max. Range 0.4 - 0.8	0.444	0.437	0.003	0.15
40-60% Max. Range 0.8 – 1.2	0.854	0.850	0.004	0.20
60-80% Max. Range 1.2 – 1.6	1.370	1.368	0.002	0.10
80-100% Max. Range 1.6 – 2.0	1.706	1.695	0.011	0.55

*Acceptable tolerance is 4%.

The uncertainty of measurement is ±0.4" WC. This is based on the reference standard having a TAR (Test Accuracy Ratio) of at least 4:1.

Technician signature: _____ Date: 8/2/19

Reviewed by: _____ Date: 08/27/19

Thermal Metering System Calibration
Y Factor

Manufacturer:	Apex
Model:	XC-60-EP
Serial Number:	0702004
OMNI Tracking No.:	OMNI-00372
Calibrated Orifice:	☐ Yes

Average Gas Meter y Factor	Orifice Meter dH@
0.989	N/A

Calibration Date:	07/02/19	
Calibrated by:	B. Davis	
Calibration Frequency:	6 months	
Next Calibration Due:	7/17/2019	
Instrument Range:	1.000	cfm
Standard Temp.:	68	oF
Standard Press.:	29.92	"Hg
Barometric Press., Pb:	30.2	"Hg
Signature/Date:		8/27/19

Previous Calibration Comparision

Date	1/17/2019	Acceptable Deviation (5%)	Deviation
y Factor	0.996	0.0498	0.007
Acceptance	Acceptable		

Current Calibration

Acceptable y Deviation	0.020
Maximum y Deviation	0.004
Acceptable dH@ Deviation	N/A
Maximum dH@ Deviation	N/A
Acceptance	Acceptable

Reference Standard *			
Standard Calibrator	Model	Standard Test Meter	
	S/N	OMNI-00001	
	Calib. Date	14-Nov-18	
	Calib. Value	0.9981	y factor (ref)

Calibration Parameters	Run 1	Run 2	Run 3
Reference Meter Pressure ("H2O), Pr	0.00	0.00	0.00
DGM Pressure ("H2O), Pd	2.00	1.00	0.80
Initial Reference Meter	204.6	212.1	218.7
Final Reference Meter	212	218.6	226
Initial DGM	0	0	0
Final DGM	7.432	6.584	7.406
Temp. Ref. Meter (°F), Tr	72.7	72.8	73.7
Temperature DGM (°F), Td	75.0	75.0	76.0
Time (min)	41.3	51.5	64.5
Net Volume Ref. Meter, Vr	7.400	6.500	7.300
Net Volume DGM, Vd	7.432	6.584	7.406
Gas Meter y Factor =	**0.993**	**0.987**	**0.986**
Gas Meter y Factor Deviation (from avg.)	0.004	0.002	0.003
Orifice dH@	**N/A**	**N/A**	**N/A**
Orifice dH@ Deviation (from avg.)	N/A	N/A	N/A

where:

1. Deviation = |Average value for all runs - current run value|

** 2. y = [Vr x (y factor (ref)) x (Pb + (Pr/ 13.6)) x (Td + 460)]/ [Vd x (Pb + (Pd / 13.6)) x (Tr + 460)]

** 3. dH@ = 0.0317 x Pd / (Pb (Td + 460)) x [(Tr + 460) x time) / Vr]^2

* Reference calibration is traceable to NIST through NIST Test # 40674, Kimble ASTM E1272, or NIST traceable laboratory

** Equations come from EPA Method 5

The uncertainty of measurement is ±0.14 ft^3/min. This is based on the reference standard having a TAR (Test Accuracy Ratio) of at least 4:1.

Reviewed By 8/27/19

Temperature Calibration
EPA Method 28R, ASTM 2515

Booth:	Temperature Monitor Type:	Equipment Number:
Mobile	National Instruments Logger	00371, 00372

Reference Meter Equipment Number: 00373	Calibration Due Date: 8/02/17

Calibration Performed By:	Date:	Ambient Temperature:	Barometric Pressure:
B. Davis	7/02/19	74	30.21

Input Temperature (F)	Ambient	Meter A	Meter B	Filter A	Filter B	Tunnel	FB Interior
0	-1	0	0	0	-0	1	1
100	99	100	100	100	99	101	101
300	299	300	300	300	299	300	300
500	499	500	500	500	499	500	500
700	699	700	700	700	700	701	700
1000	999	1000	1000	1000	1000	1000	1000

Input (F)	FB Top	FB Bottom	FB Back	FB Left	FB Right	Imp A	Imp B	Cat	Stack
0	1	1	1	1	0	0	-0	0	1
100	101	101	101	101	101	100	100	100	101
300	300	300	300	300	300	299	299	299	301
500	500	500	500	500	501	499	499	499	501
700	700	700	700	700	700	699	699	699	700
1000	1001	1000	1001	1000	1001	1000	1000	1000	1001
1500								1499	
2000								1999	

Technician signature: _____ Date: 7/2/19

Reviewed By: _____ Date: 08/27/19

DIFFERENTIAL PRESSURE GAUGE CALIBRATION DATA SHEET

Instrument to be calibrated: Pressure Transducer

Maximum Range: 0-2" WC ID Number: OMNI-00372

Calibration Instrument: Digital Manometer ID Number: OMNI-00395

Date: 7/15/19 By: B. Davis

This form is to be used only in conjunction with Standard Procedure C-SPC.

Range of Calibration Point ("WC)	Digital Manometer Input ("WC)	Pressure Gauge Response ("WC)	Difference (Input - Response)	% Error of Full Span*
0-20% Max. Range 0 - 0.4	0.034	0.032	0.002	0.10
20-40% Max. Range 0.4 - 0.8	0.760	0.761	0.001	0.05
40-60% Max. Range 0.8 – 1.2	0.982	0.979	0.003	0.15
60-80% Max. Range 1.2 – 1.6	1.384	1.383	0.001	0.05
80-100% Max. Range 1.6 – 2.0	1.750	1.751	0.001	0.05

*Acceptable tolerance is 4%.

The uncertainty of measurement is ±0.4" WC. This is based on the reference standard having a TAR (Test Accuracy Ratio) of at least 4:1.

Technician signature: _____ Date: 8/2/19

Reviewed by: _____ Date: _____

Certificate of Calibration

Certificate Number: **686722**

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Omni-Test Laboratories
13327 NE Airport Way
Portland, OR 97230

A2LA ACCREDITED 0723.01 Calibration

PO: **180192**
Order Date: 10/22/2018
Authorized By: **N/A**

Property #: OMNI-00410
User: N/A
Department: N/A
Make: Dwyer
Model: 1430
Serial #: OMNI-00410
Description: Microtector
Procedure: DCN 500908
Accuracy: ±0.00025" WC

Calibrated on: 10/30/2018
*Recommended Due: 10/30/2019
Environment: 22 °C 44 % RH
* As Received: Limited
* As Returned: Limited
Action Taken: Calibrated
Technician: **111**

Remarks: * Many factors may cause the unit to drift out of calibration before the recommended due date. Any reported error is the absolute value between the reference and the unit. Uncertainties include the effects of the unit.

Previous limitation of micrometer head calibrated only continued. .001" reading micrometer head ±.001" (LSD) tolerance applied.

Standards Used

Std ID	Manufacturer	Model	Nomenclature	Due Date	Trace ID
541A	Select	E8FED2	Gage Block Set, 8pc	12/18/2018	663864

Measurement Data

Parameter / Measurement Description	Range Unit	Reference	Min	Max	ᵏError	UUT	Uncertainty Accredited = ✓
Before/After							
Length							
	Inch	0.1300	0.129	0.131	0.001	0.129 Inch	1.1E-03 ✓
	Inch	0.3850	0.384	0.386	0.001	0.384 Inch	1.1E-03 ✓
	Inch	0.6150	0.614	0.616	0.001	0.614 Inch	1.1E-03 ✓
	Inch	0.8700	0.869	0.871	0.001	0.869 Inch	1.1E-03 ✓
	Inch	1.0000	0.999	1.001	0.001	0.999 Inch	1.1E-03 ✓

Reviewer

3 Issued 10/31/2018 Rev # 15

Inspector

Calibration Record

Vaneometer Air Velocity Meter OMNI-00559

Calibration Service Record			
Date	**By**	**Results**	**Date of next Calibration**
11/17/17	BD	Installed New Vane From Manufacturer	5/17/18
7/12/18	BR	Installed New Vane from Manufacturer	1/12/19
6/13/19	BR	Installed New Vane From Manufacture	6/15/19
6/13/19	BD	Installed New Vane From Manufacture	12/13/19

VWR Temperature Hygrometer Calibration Procedure and Data Sheet

Frequency: Every Two Years

Step 1: Locate NIST traceable standard.

Step 2: Place unit to be calibrated, tracking No. OMNI-00592, inside OMNI desiccate box on the same shelf with the NIST traceable standard.

Step 3: After a period of not less than four hours record the temperature and humidity of both units in the spaces provide below.

Step 4: If the unit to be calibrated matches the NIST standard within ± 4%, it is acceptable. If not, the unit needs to be sent to a repair company or replaced.

Verification Data:

Date: 1/29/19 ~~1/28/19~~ pa Technician: BDAVIS

Time in desiccate: 0840 Recording time: 1415

NIST Standard Temperature: 70.2 °F NIST Standard Humidity: 14.6

Test Unit Temperature Reading: 69.9 °F Test Unit Humidity Reading: 12.1

Test unit OMNI- 00592 is X or was not ___ within acceptable limits.

Technician Signature: [signature]

Comments: A difference of 2.5% was found, with a full scale of 90% on the Instrument this gives a 2.77% deviation.

ZRE NDIR/O_2

USER'S MANUAL

1312 West Grove Avenue
Orange, CA 92865-4134
Phone: 714-974-5560 Fax: 714-921-2531
www.gasanalyzers.com

Certificate of Calibration

Certificate Number: **704810**

JJ Calibrations, Inc.
7007 SE Lake Rd
Portland, OR 97267-2105
Phone 503.786.3005
FAX 503.786.2994

OnSite

ACCREDITED
0723.01
Calibration

Omni-Test Laboratories
13327 NE Airport Way
Portland, OR 97230

PO: **190241**
Order Date: **07/10/2019**
Authorized By: **N/A**

Property #: **OMNI-00637**
User: **N/A**
Department: **N/A**
Make: **Mettler Toledo**
Model: **MS104TS/00**
Serial #: **B729400181**
Description: **Analytical Scale, 120g**
Procedure: **DCN 500887**
Accuracy: **±0.0005g**

Calibrated on: **07/10/2019**
*Recommended Due: **01/10/2020**
Environment: **21** °C **39** % RH
* As Received: **Within Tolerance**
* As Returned: **Within Tolerance**
Action Taken: **Calibrated**
Technician: **111**

Remarks: * Many factors may cause the unit to drift out of calibration before the recommended due date. Any reported error is the absolute value between the reference and the unit. Uncertainties include the effects of the unit.

Standards Used

Std ID	Manufacturer	Model	Nomenclature	Due Date	Trace ID
723A	Rice Lake	1mg-200g (Class 0)	Mass Set,	05/22/2020	694890

Measurement Data

Parameter / Measurement Description	Range Unit	Reference	Min	Max	ᵏError	UUT	Uncertainty Accredited = ✓
Before/After							
Force							
	g	10.00000	9.9995	10.0005	0.0000	10.0000 g	1.2E-05 ✓
	g	30.00000	29.9995	30.0005	0.0000	30.0000 g	1.3E-05 ✓
	g	60.00000	59.9995	60.0005	0.0001	60.0001 g	1.8E-05 ✓
	g	90.00000	89.9995	90.0005	0.0000	90.0000 g	2.1E-05 ✓
	g	120.00000	119.9995	120.0005	0.0001	119.9999 g	2.9E-05 ✓

JJ Calibrations, Inc. certifies that this instrument has been calibrated in accordance with the JJ Calibrations Quality Assurance Manual with the stated procedure using standards that are traceable to the National Institute of Standards and Technology (NIST), or other National Measurement Institutes (NMI's), or by using natural physical constants, intrinsic standards or ratio calibration techniques. The quality system and this certificate are in compliance with ANSI/NCSL Z540-1-1994, ISO/IEC 17025-2005, ISO 10012-1, the ISO 9000 family and QS 9000. The expanded uncertainties of measurements for this calibration are based upon 95% (2 sigma) confidence limits. Unless otherwise stated, a test accuracy ratio (TAR) of 4:1, if achievable, is maintained. The results reported herein apply only to the calibration of the item described above. This report may not be reproduced, except in full, without prior written consent of JJ Calibrations, Inc.
JJ Calibrations, Inc. quality system has been assessed and accredited to ISO/IEC 17025:2005.

Reviewer

3 Issued 07/12/2019 Rev # 15

Inspector

Example Calculations

Equations and Sample Calculations

Manufacturer:	Hearth & Home
Model:	Dauntless NC
Run:	2
Category:	I

Equations used to calculate the parameters listed below are described in this appendix. Sample calculations are provided for each equation. The raw data and printout results from a sample run are also provided for comparison to the sample calculations.

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

BR – Dry burn rate, kg/hr

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

Q_{sd} – Average gas flow rate in dilution tunnel, dscf/hr

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

m_n – Total particulate matter collected, mg

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

E_T – Total particulate emissions, g

PR - Proportional rate variation

PM_R – Particulate emissions for test run, g/hr

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

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

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

Where,

θ = Total length of test run, min

Sample Calculation:

M_{Bdb} = 7.58 kg

θ = 480 min

$$BR = \frac{60 \times 7.575}{480}$$

BR = **0.95** kg/hr

V_s – Average gas velocity in the dilution tunnel, ft/sec
ASTM E2515 equations (9)

$$v_s = F_P \times k_p \times C_p \times (\sqrt{\Delta P})_{avg} \times \sqrt{\frac{T_{s(avg)}}{P_s \times M_s}}$$

Where:

F_p	=	Adjustment factor for center of tunnel pitot tube placement, Fp = $\frac{V_{strav}}{V_{scent}}$, ASTM E2515 Equation (1)
v_{scent}	=	Dilution tunnel velocity calculated after the multi-point pitot traverse at the center, ft/sec
v_{strav}	=	Dilution tunnel velocity calculated after the multi-point pitot traverse, ft/sec
k_p	=	Pitot tube constant, 85.49
C_p	=	Pitot tube coefficient: 0.99, unitless
ΔP*	=	Velocity pressure in the dilution tunnel, in H_2O
T_s	=	Absolute average gas temperature in the dilution tunnel, °R; (°R = °F + 460)
P_s	=	Absolute average gas static pressure in dilution tunnel, = P_{bar} + P_g , in Hg
P_{bar}	=	Barometric pressure at test site, in. Hg
P_g	=	Static pressure of tunnel, in. H_20; (in Hg = in H_20/13.6)
M_s	=	**The dilution tunnel wet molecular weight; M_s = 28.78 assuming a dry weight of 29 lb/lb-mole

Sample calculation:

$$Fp = \frac{18.84}{19.74} = 0.955$$

$$V_s = 0.955 \times 85.49 \times 0.99 \times 0.296 \times \left(\frac{89.9 + 460}{\left(29.70 + \frac{-0.28}{13.6} \right) \times 28.78} \right)^{1/2}$$

V_s = **19.19** ft/s

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

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

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

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

Where:

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

Sample calculation:

$$Q_{sd} = 3600 \times (1 - 0.02) \times 19.19 \times 0.196 \times \frac{528}{89.9 + 460} \times \frac{29.7 + \frac{-0.28}{13.6}}{29.92}$$

Q_{sd} = **12658.0** dscf/hr

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

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

Where:

K_1	=	17.64 °R/in. Hg
V_m	=	Volume of gas sample measured at the dry gas meter, dcf
Y	=	Dry gas meter calibration factor, dimensionless
P_{bar}	=	Barometric pressure at the testing site, in. Hg
ΔH	=	Average pressure differential across the orifice meter, in. H_2O
T_m	=	Absolute average dry gas meter temperature, °R

Sample Calculation:

Using equation for Train 1:

$$V_{m(std)} = 17.64 \times 79.643 \times 0.992 \times \frac{\left(29.7 + \frac{2.28}{13.6}\right)}{(81.6 + 460)}$$

$V_{m(std)}$ = **76.850** dscf

Using equation for Train 2:

$$V_{m(std)} = 17.64 \times 83.642 \times 0.989 \times \frac{\left(29.7 + \frac{1.79}{13.6}\right)}{(80.0 + 460)}$$

$V_{m(std)}$ = **80.597** dscf

Using equation for ambient train:

$$V_{m(std)} = 17.64 \times 0.00 \times 0 \times \frac{\left(29.7 + \frac{0.00}{13.6}\right)}{(76.4 + 460)}$$

$V_{m(std)}$ = **0** dscf

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

$$m_n = m_p + m_f + m_g$$

Where:

m_p = mass of particulate matter from probe, mg

m_f = mass of particulate matter from filters, mg

m_g = mass of particulate matter from filter seals, mg

Sample Calculation:

Using equation for Train 1 (first hour):

m_n = 0.0 + 0.2 + 0.0

m_n = 0.2 mg

Using equation for Train 1 (post-first hour):

m_n = 0.0 + 1.7 + 0.0

m_n = 1.7 mg

Train 1 aggregate:

m_n = 0.2 + 1.7

m_n = **1.9** mg

Using equation for Train 2:

m_n = 0 + 2.2 + 0.1

m_n = **2.3** mg

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

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

Where:

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

Sample calculation:

For Train 1:

$$C_s = 0.001 \times \frac{1.9}{76.85}$$

C_s = **0.00002** g/dscf

For Train 2

$$C_s = 0.001 \times \frac{2.3}{80.60}$$

C_s = **0.00003** g/dscf

For Ambient Train

$$C_r = 0.001 \times \frac{0.0}{0}$$

C_r = **0** g/dscf

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

$$E_T = (C_s - C_r) \times Q_{std} \times \theta$$

Where:

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

Sample calculation:

For Train 1

E_T = (0.000025 - 0) x 12658.0 x 480 /60

E_T = 2.50 g

For Train 2

E_T = (0.000029 - 0) x 12658.0 x 480 /60

E_T = 2.89 g

Average

E = 2.70 g

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

7.5% of the average =	0.20
Train 1 difference =	0.19
Train 2 difference =	0.19

PR - Proportional Rate Variation
ASTM E2515 equation (16)

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

Where:

θ = Total sampling time, min

θ_i = Length of recording interval, min

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

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

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

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

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

T_m = Absolute average dry gas meter temperature, ^oR

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

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

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

$$PR = \left(\frac{480 \times 0.14 \times 19.19 \times (133.0 + 460) \times (81.6 + 460)}{1 \times 79.64 \times 20.20 \times (89.9 + 460) \times (83.0 + 460)} \right) \times 100$$

PR = 86 %

PM_R – Particulate emissions for test run, g/hr
ASTM E2780 equation (6)

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

Where,

E_T = Total particulate emissions, grams

θ = Total length of full integrated test run, min

Sample Calculation:

E_T (Dual train average) = 2.70 g

θ = 480 min

$PM_R = 60$ x (2.70 / 480)

PM_R = **0.34** g/hr

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

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

Sample Calculation:

E_T (Dual train average)	=	2.70 g
M_{Bdb}	=	7.58 kg
PM_F	=	2.70 / 7.58
PM_F	=	**0.36** g/kg

Alt 125 Letter

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
RESEARCH TRIANGLE PARK, NC 27711

FEB 2 8 2018

Mr. Justin White

OFFICE OF
AIR QUALITY PLANNING
AND STANDARDS

Dear Mr. White,

I am writing in response to your letter dated January 12, 2018, regarding wood heaters manufactured by Hearthstone QHPP, Inc. (Hearthstone). This response, dated February 28, 2018, supercedes our previous response (dated February 26, 2018) to correct an inaccuracy regarding required changes to ASTM E3053-17.

You are requesting to use an alternative test method, using cord wood, as referenced in section 60.532(c) of 40 CFR part 60, Subpart AAA, Standards of Performance for New Residential Wood Heaters (Subpart AAA) to meet the 2020 cord wood alternative compliance option. The 2020 cord wood alternative compliance option states that each affected wood heater manufactured or sold at retail for use in the United States on or after May 15, 2020, must not discharge into the atmosphere any gases that contain particulate matter in excess of 2.5 g/hr. Compliance must be determined by a cord wood test method approved by the Administrator along with the procedures in 40 CFR 60.534. You have requested approval to use the procedures and specifications found in ASTM Method E3053-17, a cord wood test method titled, "Standard Test Method for Determining Particulate Matter Emissions from Wood Heaters using Cordwood Test Fuel," in conjunction with ASTM E2515-11 and Canadian Standards Administration (CSA) Method CSA-B415.1-10, which are specified in 40 CFR 60.534.

We understand that Hearthstone is also requesting that the alternative method proposed above be approved to apply broadly to all wood heaters manufactured by Hearthstone meeting the requirements of Subpart AAA, from the approval date of this request until such time that Subpart AAA is revised or replaced to require a different cord wood certification method, providing all requirements of section 60.533 of Subpart AAA are met.

With the caveats set forth below, we approve your alternative test method request for certifying wood heaters using ASTM E3053-17 in conjunction with section 60.534 of Subpart AAA to meet the 2020 cord wood compliance option until such time that Subpart AAA is revised or replaced to require a different cord wood certification method. We also approve application of this alternative method to all wood heaters manufactured by Hearthstone meeting the requirements of Subpart AAA.

As required in Subpart AAA, section 60.354(d), you or your approved test laboratory must also measure the first hour of particulate matter emissions for each test run using a separate filter in one of the two parallel sampling trains. These results must be reported separately and also included in the total particulate matter emissions per run. Also, as required by Subpart AAA, section 60.534(e), you must have your approved laboratory measure the efficiency, heat output, and carbon monoxide emissions of the tested wood heater using CSA-B415.1-10. For measurement of particulate matter emission concentrations, ASTM 2515-11 must be used.

The following change to ASTM E3053-17 must be followed:

1. Coal bed conditions prior to loading test fuel. The coal bed shall be a level plane without valleys or ridges for all test runs in the high, low, and medium burn rate categories.

The following changes to ASTM E2515-11 must be followed:

1. The filter temperature must be maintained between 80 and 90 degrees F during testing.

2. Filters must be weighed in pairs to reduce weighing error propagation; see ASTM 2515-11, Section 10.2.1 Analytical Procedure.

3. Sample filters must be Pall TX-40 or equivalent Teflon-coated glass fiber, and of 47 mm, 90 mm, 100 mm, or 110 mm in diameter.

4. Only one point is allowed outside the +/- 10 percent proportionality range per test run.

A copy of this letter must be included in each certification test report where this alternative test method is utilized.

It is reasonable that this alternative test method approval be broadly applicable to all wood heaters subject to the requirements of 40 CFR part 60, Subpart AAA. For this reason, we will post this letter as ALT-125 on our website at *http://www3.epa.gov/ttn/emc/approalt.html* for use by other interested parties. As noted earlier in this letter, this alternative method approval is valid until such time that Subpart AAA is revised or replaced to require a different cord wood certification method, and at such time, this alternative will be reconsidered and possibly withdrawn.

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 M. Johnson, Group Leader
Measurement Technology Group

cc: Amanda Aldridge, EPA/OAQPS/OID
Adam Baumgart-Getz, EPA/OAQPS/OID
Rafael Sanchez, EPA/OECA
Michael Toney, EPA/OAQPS/AQAD

APPENDIX A

Firebox Volume

Firebox Volume

Hearth & Home Technologies

B Davis
10/1/19

Dauntless Flexburn CAT and Non-Cat model.
0061WS104E
2389

H	W	D
17.0	18.5	10.0

$V_1 = 17.0 \times 18.5 \times 10 = \underline{1.82\ ft^3}$