Section 4

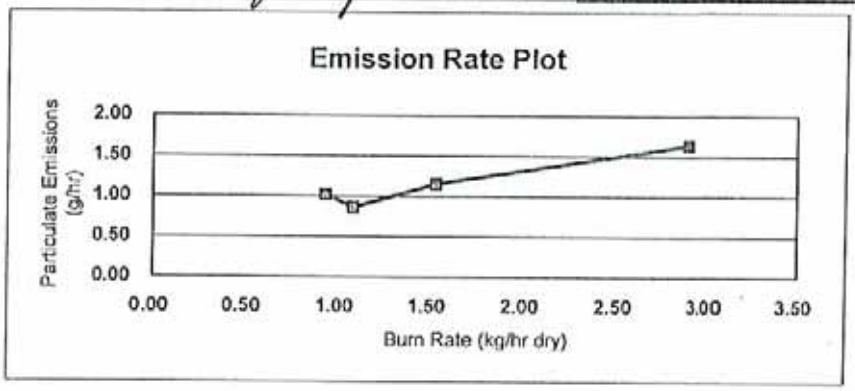
Test Data by Run

EPA Weighted Average Emissions
EPA Method 28

Client: Harman Stove Comp
Stove Model: Large Wood Stove
Test Dates: 2/26/07 - 3/02/07
Project Number: 135-S-18-3
Tracking Number: 984
Signature/Date: K. J. Morgan 10-11-07

Status: FINAL
Stove Type: Non-Catalytic Stove

Weighted Average (g/hr)
1.1



Run #	3	
Burn Rate (dry kg/hr)	0.93	
Catagory	2	
Overall Efficiency (%)	63%	
Emissions (g/hr)	1.02	
Cap (g/hr)	15	
Weighting Factor	0.439	26.35%
Heat Output (BTU/hr)	11238	

Run #	5	
Burn Rate (dry kg/hr)	1.08	
Catagory	2	
Overall Efficiency (%)	63%	
Emissions (g/hr)	0.86	
Cap (g/hr)	15	
Weighting Factor	0.451	27.06%
Heat Output (BTU/hr)	13050	

Run #	6	
Burn Rate (dry kg/hr)	1.53	
Catagory	3	
Overall Efficiency (%)	63%	
Emissions (g/hr)	1.15	
Cap (g/hr)	18	
Weighting Factor	0.543	32.61%
Heat Output (BTU/hr)	18488	

Run #	1	
Burn Rate (dry kg/hr)	2.89	
Catagory	4	
Overall Efficiency (%)	63%	
Emissions (g/hr)	1.64	
Cap (g/hr)	18	
Weighting Factor	0.233	13.97%
Heat Output (BTU/hr)	34921	

Run 1

OMNI-Test Laboratories, Inc.

Wood Heater Test Data - EPA Method 5G

Manufacturer: Harman Stove Company
Model: Large Woodstove
Project No.: 984
Tracking No.: 135-S-18-3
Run: 1
Test Date: 02/26/07

Burn Rate	2.89 kg/hr dry
Particulate Concentration (dry-standard) Particulate Emission Rate Adjusted Emissions	0.00010 grams/dscf 0.88 grams/hour 1.64 grams/hour
Average Tunnel Temperature	132 degrees Fahrenheit
Average Delta p	0.041 inches H20
Total Sample Volume - Vm Average Gas Meter Temperature Average Gas Velocity in Dilution Tunnel - vs Average Gas Flow Rate in Dilution Tunnel - Qsd Total Sample Volume (Standard Conditions) - Vms	77.83 cubic feet 83 degrees Fahrenheit 14.52 feet/second 8528.57 dscf/hour 72.43 dscf
Total Particulates - mn Average Delta H Total Time of Test	7.5 mg 0.79 inches H20 150 minutes

OMNI-Test Laboratories, Inc.

Wood Heater Test Data - EPA Method 5G

Run: 1

Manufacturer:	Harman Stove Company
Model:	Large Woodstove
Tracking No.:	984
Project No.:	135-S-18-3
Test Date:	26-Feb-07
Beginning Clock Time:	16:03
Recording Interval:	10 min.
Total Sampling Time:	150 min.

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	
Initial dP	0.043	0.044	0.041	0.040	0.036	0.040	0.042	0.044	"H2O
Initial Temp.	141	141	141	141	140	140	140	140	oF

OMNI Equipment Numbers: _____

PM Control Module:	HAR-06				
Dilution Tunnel MW(dry):	29.00	lb/lb-mole			
Dilution Tunnel MW(wet):	28.56	lb/lb-mole			
Dilution Tunnel H2O:	4.00	percent			
Dilution Tunnel Static:	-0.302	"H2O			
Pitot Tube Cp:	0.99				
Meter Box Y Factor:	0.983				
Barometric Pressure:	Begin	Middle	End	Average	
	29.03	29.05	29.07	29.05	"Hg

Signature/Date: K. Morgan 7-23-07

Tunnel Velocity:	14.52	ft/sec.
Intial Tunnel Flow:	141.0	scfm
Average Tunnel Flow:	142.1	scfm
Tunnel Area:	0.1963	ft2
Post-Test Leak Check:	.002 @ 5	cfm@"Hg
Fuel Moisture (dry basis	23.02	%
Total Particulate:	7.5	mg
Filter Holder No.:		

Elapsed Time	Particulate Sampling Data								Fuel Weight, lb		Wood Heater Temperature Data, oF											Stack	
	Gas Meter Cubic Feet	Sample Rate, cfm	Orifice dH	Meter oF	Meter Vac. In. Hg.	Dilution Tunnel Temp.	Dilution Tunnel dP	Pro. Rate (10%)	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Firebox Interior	Average Surface	Stack	Filter	Impinger exit	Ambient	Draft In. H2O	Catalyst Temp.
0	10.205		0.00	80	0	141	0.041		19.6		569	206	386	456	415		406.4	503	80	81	83	-0.063	
10	14.873	0.47	0.75	80	1	134	0.041	91	17.5	-2.1	450	216	417	443	413		387.8	525	84	66	83	-0.066	
20	19.855	0.50	0.75	80	1	139	0.041	98	15.0	-2.5	456	212	455	422	423		393.6	562	87	67	83	-0.069	
30	24.824	0.50	0.75	81	1	141	0.041	98	12.3	-2.7	499	203	469	414	445		406.0	578	91	65	84	-0.068	
40	29.845	0.50	0.75	82	1	143	0.041	99	9.7	-2.6	548	193	459	415	477		418.4	577	91	65	85	-0.068	
50	34.920	0.51	0.80	83	1	142	0.041	99	7.5	-2.2	612	187	446	424	485		430.8	565	88	64	85	-0.066	
60	40.020	0.51	0.80	83	1	141	0.041	100	5.6	-1.9	632	184	442	440	491		437.8	546	87	64	85	-0.064	
70	45.160	0.51	0.90	84	1	135	0.041	100	4.3	-1.3	624	180	401	454	494		430.6	495	86	64	81	-0.059	
80	50.530	0.54	0.90	84	1	133	0.041	104	3.6	-0.7	621	183	346	463	488		420.2	459	85	63	85	-0.055	
90	55.925	0.54	0.88	84	1	130	0.041	104	2.8	-0.8	604	186	316	468	480		410.8	444	84	63	85	-0.054	
100	61.135	0.52	0.88	84	1	127	0.041	101	2.1	-0.7	611	191	300	471	478		410.2	431	84	63	85	-0.052	
110	66.730	0.56	0.90	84	1	123	0.041	108	1.6	-0.5	635	196	285	481	481		415.6	423	84	62	84	-0.051	
120	72.130	0.54	0.88	84	1	122	0.041	104	1.1	-0.5	626	201	274	487	483		414.2	412	85	62	83	-0.050	
130	77.450	0.53	0.88	83	1	121	0.041	102	0.7	-0.4	610	206	268	488	481		410.6	408	85	61	82	-0.050	
140	82.740	0.53	0.88	83	1	119	0.041	102	0.2	-0.5	600	213	259	486	478		407.2	398	85	61	84	-0.048	
150	88.039	0.53	0.88	83	1	118	0.041	102	0.0	-0.2	588	217	252	482	473		402.4	393	85	61	84	-0.048	
Avg/Total	77.834	0.52	0.79	82.63		131.78	0.041	100.65									4		85.69	64.50		-0.058	#DIV/0!

Final Laboratory Report - Method 5G
Dilution Tunnel Particulate Calculations

Client Name: Harman Stove Company
Model: Large Wood Stove
Project No.: 135-S-18-3
Tracking No.: 984

Equipment Numbers:

Run #: 1
Date: 02/26/07

Sample Component	Reagent	Filter # or Volume, ml	Weights			
			Final, mg	Tare, mg	Blank, mg/ml	Particulate, mg
A. Front filter catch	Filter	1A	604.4	600.3		4.1
B. Rear filter catch	Filter	1B	598.6	598.8		-0.2
C. Rinse of probe and filter assembly	Acetone	125	109558.0	109553.8	0.0045	3.6

Total Particulate, mg :	7.5

Component	Equations:
A. Front filter catch	Final (mg) - Tare (mg) = Particulate, mg
B. Rear filter catch	Final (mg) - Tare (mg) = Particulate, mg
C. Rinse of probe and filter assembly	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg

Analyst: K. L. Morgan Date: 3-12-07

OMNI-Test Laboratories, Inc.
Beaverton, OR Phone (503) 643-3788

STOVE TEMPERATURE TEST DATA - METHOD 5G R & D

Client/Model: _Harman Stove Company / Large Wood Stove **Project #:** 135-S-18.3_____ **Tracking #:** ___984_____

Date: 2-26-07 Test Crew: K. Morgan Run #: 1

OMNI Equipment ID #: _____

Preburn [X] Coal Bed:
Test [ ] Data: 0 = Range: 4.0 - 4.9 Actual: Coal Bed: 4.8

Time	Fuel Weight	Delta Weight	Stack Draft	TEMPERATURES (oF) Ambient	Top	Bottom	Back	Left	Right	Flue	~~Catalyst~~ not used	% GASES O2	CO2	CO
0	23.2		~~-.059~~	70	233	~~182~~ 283	349	190	180	368				
10	20.0		-.062	74	369	91	297	217	213	451				
20	17.0		-.070	75	383	103	264	260	251	479				
30	14.0		-.073	77	471	118	314	304	284	579				
40														
50	9.2		-.069	81	564	150	407	400	360	568				
60	7.4		-.066	81	589	167	431	424	386	544				
70	6.1		-.064	82	585	183	427	441	401	520				
80	5.1		-.061	83	573	200	399	454	412	493				
82 ~~90~~	4.8		-.063	83	569	206	386	456	415	503				
00														
10														
20														
30														
40														
50														
60														
70								Preliminary: 2.89 @ 1.52						
80														
90														
AVG														

Technician signature: K. A. Morgan Date: 2-26-07

OMNI-Test Laboratories, Inc.
Beaverton, OR

FUEL DATA

Client: Harman Stove Company
Model: Large Wood Stove
Project #: 135-S-18-3 Tracking #: 984
Date: 2-26-07 Test Crew: K. Morgan Run #: 1
OMNI Equipment ID #:
FUEL LOAD PREPARED BY: K. Morgan
FUEL: DOUGLAS-FIR SPECIES, UNTREATED, AIR-DRIED, STANDARD GRADE OR BETTER, DIMENSIONAL LUMBER.

PRE-BURN FUEL

MOISTURE CONTENT (METER – – DRY BASIS)

CALIBRATION: Cal Value (1) = 12% Actual Reading 12.0
Cal Value (2) = 22% Actual Reading 22.0

Piece	Length		Readings		Type
1	8 ft	22.1	20.1	20.9	2x4
2	8 ft	24.8	24.4	23.8	2x4
3	8 ft	23.8	23.8	22.0	2x4

Length of cut pieces: 27@8" inches Pre-Burn Fuel Average Moisture: 22.86 %

Time (clock): 13:20 Room Temperature (F): 73 Initials: K

TEST FUEL

FUEL TYPE AND AMOUNT: 2 × 4 25 4 × 4 2
CALCULATED LOAD WEIGHT: ACTUAL LOAD WEIGHT: 11.3 (2 × 4)
8.3 (4 × 4)
FUEL PIECE LENGTH: 17.0" 19.6 Total

MOISTURE CONTENT (METER – – DRY BASIS)

PIECE	READINGS			TYPE
1	24.5	21.9	23.8	2x4
2	25.3	21.9	23.8	2x4
3	22.7	20.0	24.7	4x4
4	20.9	22.0	23.2	2x4
5	24.8	22.4	24.9	2x4
6	22.2	20.4	24.8	4x4
7	24.6	20.2	24.4	2x4
8				
9				
10				

OVERALL TEST FUEL LOAD MOISTURE AVERAGE: 23.02 %

Time (clock): 13:30 Room Temperature (F): 73 Initials: K

Technician signature: K. Morgan Date: 2-26-07

OMNI-Test Laboratories, Inc.
Beaverton, OR

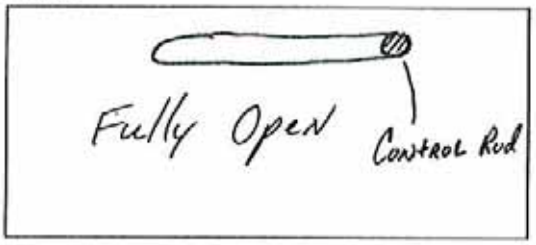
Run Notes

Client/Model: Harman Stove Company
Model: Large Wood Stove
Project #: 135-S-18-3
Tracking Number: 984
Run #: 1 Date: 2-26-07
Test Crew: K. Morgan
OMNI Equipment ID Numbers: _____

PREBURN

DESCRIBE OR SKETCH AIR OR THERMOMSTAT SETTINGS BELOW: (SETTINGS MUST BE ACCURATE AND REPRODUCABLE)

PRIMARY:



SECONDARY: Fixed

TERTIARY: N/A

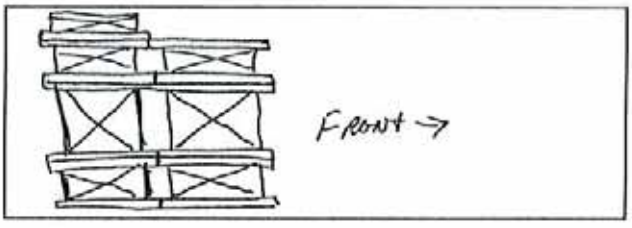
FAN: ON - High

PREBURN SETTINGS AND ACTIVITIES

TIME	AIR (THERMO) CHANGES PRIMARY/SECONDARY/TERTIARY	FAN SETTING CHANGE	ADD FUEL + WT.	ADD FUEL - WT.	RAKE COAL	COMMENT
0	test setting					
82					X	levelled

TEST

TEST FUEL CONFIGURATION SKETCH
(INDICATE VIEW ANGLE)



START UP PROCEDURES
BYPASS: Not Used
FUEL LOADING Loaded by 55 sec.
DOOR: Closed at 65 sec.
PRIMARY AIR: Not Used - High burn

OTHER: NONE

DESCRIBE OR SKETCH TEST SETTINGS BELOW: (SETTINGS MUST BE ACCURATE AND REPRODUCIBLE)
PRIMARY:

SAME AS ABOVE

SECONDARY: Fixed

TERTIARY: N/A

FAN: ON - High

Technician signature: K. Morgan Date: 2-26-07

OMNI-Test Laboratories, Inc.
Beaverton, OR

Supplemental Data EPA 5G/5H

Client: Harman Stove Company

Model: Large Wood Stove

Project No.: 135-S-18-3 Tracking No.: 984

Date: 2-26-07 Run No.: 1 Booth: 1

Test Crew: K. Morgan Start Time: 16:03 Stop Time: 18:33

OMNI Equipment #'s: _____

Gas Analyzer Train Leak Check:

Stack: Dilution Tunnel (Method 5G Only):

Initial: _____ Initial: _____

Final: N/A Final: N/A

Calibrations: Span Gas CO_2: N/A O_2: N/A CO: N/A CO_2(DT): N/A

	N_2 Span	N_2 Span	N_2 Span	N_2 Span	N_2 Span	N_2 Span	N_2 Span
Time							
O_2							
CO_2			N/A				
CO							
CO_2 (DT)							

Stack Diameter (inches): 6.0

Air Velocity (ft/min): Initial: < 50 Final: < 50

Scale Audit (lbs.): Pretest: 10.0 Post Test: 10.0

Induced Draft: Ø %Smoke Capture: 100

Pitot Tube Leak Test: Pre: Ø @ 3.1" Post: Ø @ 3.0"

Flue Pipe Cleaned Prior to First Test in Series: Date: 2-23-07 Initials: JL

	Initial	Middle	Ending
Pb (in. Hg)	29.03	29.05	29.07
Room Temp (°F)	83	85	84

Technician signature: K. J. Morgan Date: 2-26-07

Run 2

OMNI-Test Laboratories, Inc.

Wood Heater Test Data - EPA Method 5G

Manufacturer: Harman Stove Company
Model: Large Wood Stove
Project No.: 984
Tracking No.: 135-S-18-3
Run: 2
Test Date: 02/27/07

Burn Rate	0.89 kg/hr dry
Particulate Concentration (dry-standard) Particulate Emission Rate Adjusted Emissions	0.00013 grams/dscf 1.11 grams/hour 1.99 grams/hour
Average Tunnel Temperature	94 degrees Fahrenheit
Average Delta p	0.037 inches H20
Total Sample Volume - Vm Average Gas Meter Temperature Average Gas Velocity in Dilution Tunnel - vs Average Gas Flow Rate in Dilution Tunnel - Qsd Total Sample Volume (Standard Conditions) - Vms	275.53 cubic feet 83 degrees Fahrenheit 13.21 feet/second 8336.53 dscf/hour 257.51 dscf
Total Particulates - mn Average Delta H Total Time of Test	34.3 mg 0.85 inches H20 530 minutes

OMNI-Test Laboratories, Inc.

Wood Heater Test Data - EPA Method 5G

Run:	2
Manufacturer:	Harman Stove Company
Model:	Large Wood Stove
Tracking No.:	984
Project No.:	135-S-18-3
Test Date:	27-Feb-07
Beginning Clock Time:	13:38
Recording Interval:	10 min.
Total Sampling Time:	530 min.

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	
Initial dP	0.034	0.036	0.036	0.036	0.039	0.038	0.036	0.034	"H2O
Initial Temp.	99	99	99	99	99	99	99	99	oF

OMNI Equipment Numbers: Adjusted fuel load at 500 minutes due to zero weight loss

PM Control Module:	HAR-06			
Dilution Tunnel MW(dry):	29.00	lb/lb-mole		
Dilution Tunnel MW(wet):	28.56	lb/lb-mole		
Dilution Tunnel H2O:	4.00	percent		
Dilution Tunnel Static:	-0.250	"H2O		
Pitot Tube Cp:	0.99			
Meter Box Y Factor:	0.983			
Barometric Pressure:	Begin	Middle	End	Average
	29.14	29.21	29.28	29.21 "Hg

Signature/Date: M J. Morgan 7-23-07

Tunnel Velocity:	13.21	ft/sec
Intial Tunnel Flow:	137.2	scfm
Average Tunnel Flow:	138.9	scfm
Tunnel Area:	0.1963	ft2
Post-Test Leak Check:	.001 @ 8	cfm@"Hg
Fuel Moisture (dry basis):	20.61	%
Total Particulate:	34.3	mg
Filter Holder No.:		

Elapsed Time	Particulate Sampling Data								Fuel Weight, lb		Wood Heater Temperature Data, oF											Stack	
	Gas Meter Cubic Feet	Sample Rate, cfm	Orifice dH	Meter oF	Meter Vac. In. Hg.	Dilution Tunnel Temp.	Dilution Tunnel dP	Pro. Rate (10%)	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Firebox Interior	Average Surface	Stack	Filter	Impinger exit	Ambient	Draft In H2O	Catalyst Temp.
0	88.604		0.00	84	0	99	0.036		21.0		358	137	229	322	305		270.2	287	80	80	80	-0.038	
10	93.820	0.52	0.87	83	1	104	0.038	100	19.6	-1.4	306	139	305	311	295		271.2	332	81	55	80	-0.048	
20	98.999	0.52	0.87	83	1	103	0.037	101	18.8	-0.8	270	138	316	299	286		261.8	320	80	54	79	-0.048	
30	104.230	0.52	0.87	84	1	104	0.037	102	17.7	-1.1	268	137	319	290	275		257.8	335	81	53	80	-0.050	
40	109.420	0.52	0.87	84	1	105	0.037	101	16.5	-1.2	286	136	347	284	271		264.8	354	81	53	80	-0.052	
50	114.620	0.52	0.87	84	1	107	0.037	101	15.4	-1.1	303	134	365	284	270		271.2	347	82	54	79	-0.050	
60	119.815	0.52	0.87	84	1	106	0.037	101	14.5	-0.9	313	132	353	286	270		270.8	338	83	54	78	-0.049	
70	125.011	0.52	0.87	84	1	105	0.037	101	13.6	-0.9	312	131	342	289	270		268.8	327	83	54	78	-0.047	
80	130.200	0.52	0.87	83	1	104	0.038	100	12.8	-0.8	313	130	322	293	269		265.4	321	83	54	78	-0.047	
90	135.415	0.52	0.87	83	1	103	0.037	102	11.9	-0.9	318	129	328	298	270		268.6	338	83	54	80	-0.048	
100	140.580	0.52	0.87	84	1	103	0.037	100	11.0	-0.9	324	128	346	307	273		275.6	338	83	54	80	-0.048	
110	145.750	0.52	0.87	84	1	105	0.037	101	10.1	-0.9	335	127	345	313	278		279.6	335	83	54	80	-0.047	
120	150.960	0.52	0.87	84	1	104	0.037	101	9.4	-0.7	344	126	345	317	282		282.8	339	83	54	80	-0.047	
130	156.145	0.52	0.87	85	1	105	0.037	101	8.5	-0.9	353	126	358	320	288		289.0	349	83	54	81	-0.048	
140	161.340	0.52	0.87	85	1	106	0.037	101	7.5	-1	368	126	377	326	296		298.6	359	84	54	81	-0.049	
150	166.530	0.52	0.87	85	1	107	0.037	101	6.8	-0.7	376	127	371	330	307		302.2	340	84	54	80	-0.047	
160	171.715	0.52	0.87	86	1	104	0.037	100	6.3	-0.5	380	127	337	333	312		297.8	322	84	55	81	-0.045	
170	176.910	0.52	0.87	86	1	104	0.037	101	5.8	-0.5	377	129	301	333	315		291.0	301	83	55	80	-0.042	
180	182.120	0.52	0.87	86	1	101	0.037	101	5.4	-0.4	371	130	264	333	316		282.8	273	83	55	80	-0.038	
190	187.285	0.52	0.87	86	1	99	0.038	98	5.2	-0.2	364	131	228	331	313		273.4	253	83	54	81	-0.035	NA
200	192.480	0.52	0.87	85	1	98	0.038	99	5.0	-0.2	356	130	206	328	308		265.6	242	83	54	80	-0.033	NA
210	197.680	0.52	0.87	86	1	96	0.038	99	4.7	-0.3	348	130	193	324	304		259.8	233	82	54	80	-0.032	NA
220	202.995	0.53	0.87	85	1	96	0.037	102	4.5	-0.2	344	128	183	318	299		254.4	227	82	54	79	-0.031	NA
230	208.190	0.52	0.87	85	1	95	0.038	99	4.3	-0.2	328	127	175	312	295		247.4	220	82	54	78	-0.029	NA
240	213.425	0.52	0.87	85	1	94	0.037	101	4.1	-0.2	317	126	171	307	289		242.0	215	81	54	78	-0.029	NA
250	218.650	0.52	0.87	85	1	93	0.037	100	3.9	-0.2	308	124	166	301	284		236.6	208	80	54	78	-0.028	NA
260	223.910	0.53	0.87	84	1	92	0.037	101	3.7	-0.2	300	122	163	294	279		231.6	204	81	54	78	-0.026	NA
270	229.100	0.52	0.87	84	1	92	0.037	100	3.5	-0.2	295	121	160	289	273		227.6	201	80	54	78	-0.026	NA
280	234.330	0.52	0.87	84	1	91	0.037	101	3.4	-0.1	287	120	160	282	272		224.2	201	80	54	78	-0.026	NA
290	239.555	0.52	0.87	84	1	91	0.037	100	3.2	-0.2	282	119	161	275	273		222.0	201	79	54	78	-0.027	NA
300	244.780	0.52	0.87	84	1	90	0.037	100	3.0	-0.2	281	118	160	269	275		220.6	198	79	54	78	-0.026	NA
310	250.005	0.52	0.87	83	1	89	0.036	102	2.8	-0.2	281	117	159	263	276		219.2	198	80	53	78	-0.026	NA
320	255.230	0.52	0.87	83	1	89	0.036	102	2.7	-0.1	279	117	156	259	280		218.2	195	79	54	78	-0.025	NA
330	260.460	0.52	0.87	83	1	89	0.036	102	2.5	-0.2	275	117	153	255	281		216.2	192	79	54	78	-0.025	NA
340	265.620	0.52	0.87	83	1	88	0.036	100	2.4	-0.1	272	117	150	251	281		214.2	188	79	54	78	-0.024	NA
350	270.820	0.52	0.87	82	1	88	0.036	101	2.2	-0.2	270	116	148	246	279		211.8	185	79	54	77	-0.023	NA
360	275.975	0.52	0.87	82	1	88	0.036	101	2.1	-0.1	266	116	144	243	277		209.2	181	78	54	77	-0.023	NA
370	281.185	0.52	0.87	82	1	87	0.035	103	1.9	-0.2	263	116	140	240	275		206.8	177	78	53	77	-0.022	NA
380	286.340	0.52	0.87	82	1	87	0.036	100	1.8	-0.1	260	116	137	237	274		204.8	173	78	53	77	-0.022	NA

OMNI-Test Laboratories, Inc.

Wood Heater Test Data - EPA Method 5G

Run:	2
Manufacturer:	Harman Stove Company
Model:	Large Wood Stove
Tracking No.:	984
Project No.:	135-5-18-3
Test Date:	27-Feb-07
Beginning Clock Time:	13:38
Recording Interval:	10 min.
Total Sampling Time:	530 min.

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	
Initial dP	0.034	0.036	0.036	0.036	0.039	0.038	0.036	0.034	"H2O
Initial Temp	99	99	99	99	99	99	99	99	oF

OMNI Equipment Numbers: Adjusted fuel load at 500 minutes due to zero weight loss

PM Control Module:	HAR-06
Dilution Tunnel MW(dry):	29.00 lb/lb-mole
Dilution Tunnel MW(wet):	28.56 lb/lb-mole
Dilution Tunnel H2O:	4.00 percent
Dilution Tunnel Static:	-0.250 "H2O
Pitot Tube Cp:	0.99
Meter Box Y Factor:	0.983

Barometric Pressure:

Begin	Middle	End	Average
29.14	29.21	29.28	29.21 "Hg

Signature/Date: 7-25-07

Tunnel Velocity:	17.21	ft/sec.
Intial Tunnel Flow:	137.2	scfm
Average Tunnel Flow:	138.9	scfm
Tunnel Area:	0.1963	ft2
Post-Test Leak Check:	.001 @ 8	cfm@"Hg
Fuel Moisture (dry basis):	20.61	%
Total Particulate:	34.3	mg
Filter Holder No.:		

Elapsed Time	Particulate Sampling Data: Gas Meter Cubic Feet	Sample Rate, cfm	Orifice dH	Meter oF	Meter Vac. In. Hg.	Dilution Tunnel Temp.	Dilution Tunnel dP	Pro. Rate (10%)	Fuel Weight, lb: Scale Reading	Weight Change	Wood Heater Temperature Data, oF: Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Firebox Interior	Average Surface	Stack	Filter	Impinger exit	Ambient	Stack: Draft In. H2O	Catalyst Temp.
390	291.520	0.52	0.87	82	1	86	0.036	101	1.7	-0.1	256	115	134	234	273		202.4	169	78	53	77	-0.021	NA
400	296.700	0.52	0.87	82	1	85	0.036	101	1.6	-0.1	255	115	131	231	270		200.4	168	78	53	77	-0.021	NA
410	301.885	0.52	0.87	82	1	86	0.037	100	1.4	-0.2	254	114	130	227	266		198.2	165	77	54	76	-0.020	NA
420	307.070	0.52	0.87	82	1	85	0.036	101	1.3	-0.1	249	113	128	223	263		195.2	162	77	54	77	-0.020	NA
430	312.250	0.52	0.87	82	1	85	0.036	101	1.2	-0.1	246	112	126	219	261		192.8	159	77	53	76	-0.019	NA
440	317.450	0.52	0.87	82	1	84	0.036	101	1.0	-0.2	240	111	124	215	258		189.6	157	77	53	77	-0.019	NA
450	322.650	0.52	0.87	81	1	84	0.037	100	1.0	0	234	109	122	210	256		186.2	154	77	53	76	-0.018	NA
460	327.805	0.52	0.87	81	1	84	0.036	100	0.9	-0.1	227	109	120	207	252		183.0	150	77	53	76	-0.017	NA
470	333.000	0.52	0.87	81	1	84	0.036	101	0.8	-0.1	222	107	118	201	249		179.4	146	77	53	76	-0.016	NA
480	338.220	0.52	0.87	81	1	84	0.036	102	0.7	-0.1	221	106	115	198	246		177.2	143	76	53	76	-0.016	NA
490	343.440	0.52	0.87	81	1	83	0.036	102	0.6	-0.1	218	105	114	195	242		174.8	142	76	53	76	-0.016	NA
500	348.560	0.51	0.87	81	1	82	0.036	100	0.6	0	210	104	112	191	237		170.8	141	77	53	76	-0.015	NA
510	353.745	0.52	0.87	81	1	83	0.036	101	0.3	-0.3	202	102	119	186	231		168.0	167	77	53	76	-0.021	NA
520	358.925	0.52	0.87	81	1	84	0.036	101	0.1	-0.2	208	101	138	184	226		171.4	172	77	53	76	-0.021	NA
530	364.129	0.52	0.87	81	1	84	0.036	101	0.0	-0.1	218	102	138	185	228		174.2	169	77	53	76	-0.021	NA
Avg/Total	275.525	0.52	0.85	83.31		93.96	0.04	100.75									96		80.07	54.22		-0.03	#DIV/0!

OMNI-Test Laboratories, Inc.

Final Laboratory Report - Method 5G
Dilution Tunnel Particulate Calculations

Client Name: Harman Stove Company
Model: Large Wood Stove
Project No.: 135-S-18-3
Tracking No.: 984

Equipment Numbers:

Run #: 2
Date: 02/27/07

Sample Component	Reagent	Filter # or Volume, ml	Weights			
			Final, mg	Tare, mg	Blank, mg/ml	Particulate, mg
A. Front filter catch	Filter	2A	626.8	600.0		26.8
B. Rear filter catch	Filter	2B	598.2	598.1		0.1
C. Rinse of probe and filter assembly	Acetone	100	108131.1	108123.3	0.0045	7.4

Total Particulate, mg :	34.3

Component	Equations:
A. Front filter catch	Final (mg) - Tare (mg) = Particulate, mg
B. Rear filter catch	Final (mg) - Tare (mg) = Particulate, mg
C. Rinse of probe and filter assembly	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg

Analyst: [signature] Date: 3-12-07

OMNI Test Laboratories
Beaverton, OR Phone (503) 643-3788

STOVE TEMPERATURE TEST DATA - METHOD 5G R & D

Client/Model: _Harman Stove Company / Large Wood Stove **Project #:** 135-S-18.3 **Tracking #:** 984

Date: 2-27-07 Test Crew: K. Morgan Run #: 2

OMNI Equipment ID #: _____

Preburn [ ]
Test [ ]

Coal Bed: Data: 0 = Range: 4.2 - 5.2

Actual: Coal Bed: 4.7

Time	Fuel Weight	Delta Weight	Stack Draft	TEMPERATURES (oF) Ambient	Top	Bottom	Back	Left	Right	Flue	~~Catalyst~~ Not Used	% GASES O2	CO2	CO
0	14.4		-.066	71	337	98	420	266	244	451				
10	13.4	1.0	-.056	74	332	107	425	285	257	372				
20	12.5	0.9	-.052	75	336	115	387	296	262	351				
30	11.8	0.7	-.050	76	332	119	361	301	262	336				
40	11.2	0.6	-.046	77	328	121	330	306	263	319				
50	10.6	0.6	-.044	77	325	121	312	310	262	309				
60	10.1	0.5	-.043	78	327	123	285	314	262	297				
70	9.5	0.6	-.043	78	329	125	290	317	263	302				
80	9.0	0.5	-.043	78	331	126	293	320	266	299				
90	7.8	1.2	-.055	78	344	127	307	325	271	395				
100	6.8	1.0	-.054	79	356	127	409	331	283	379				
110	6.1	0.7	-.049	79	381	126	417	338	299	351				
120	5.7	0.4	-.044	80	388	126	360	339	308	318				
130	5.4	0.3	-.041	80	384	128	310	337	311	297				
140	5.3	0.1	-.039	81	376	130	280	332	310	282				
150	5.1	0.2	-.036	81	367	133	256	328	308	266				
160	4.9	0.2	-.034	80	357	136	237	324	307	254				
163 70	4.7	0.2	-.038	80	358	137	229	322	304	270				
80														
90														
AVG														

Technician signature: K. J. Morgan Date: 2-27-07

OMNI-Test Laboratories, Inc.
Beaverton, OR

FUEL DATA

Client: Harman Stove Company
Model: Large Wood Stove
Project #: 135-S-18-3 Tracking #: 984
Date: 2-27-07 Test Crew: K. Morgan Run #: 2
OMNI Equipment ID #:
FUEL LOAD PREPARED BY: K. Morgan
FUEL: DOUGLAS-FIR SPECIES, UNTREATED, AIR-DRIED, STANDARD GRADE OR BETTER, DIMENSIONAL LUMBER.

PRE-BURN FUEL

MOISTURE CONTENT (METER -- DRY BASIS)

CALIBRATION: Cal Value (1) = 12% Actual Reading 12.0
Cal Value (2) = 22% Actual Reading 22.0

Piece	Length		Readings		Type
1	8 ft	19.2	22.0	18.9	2x4
2	8 ft	22.6	22.7	22.6	2x4
3	ft				

Length of cut pieces: 25 0 8 " inches Pre-Burn Fuel Average Moisture: 21.33%

Time (clock): 09:10 Room Temperature (F): 70 Initials: K

TEST FUEL

FUEL TYPE AND AMOUNT: 2 × 4 5 4 × 4 2
CALCULATED LOAD WEIGHT: ACTUAL LOAD WEIGHT: 11.2 (2 × 4)
9.8 (4 × 4)
FUEL PIECE LENGTH: 17.0 " 21.0 Total

MOISTURE CONTENT (METER -- DRY BASIS)

PIECE	READINGS			TYPE
1	23.0	22.1	22.8	4x4
2	22.7	20.3	19.7	4x4
3	19.3	19.6	20.0	2x4
4	21.6	20.3	18.6	2x4
5	20.6	18.8	20.3	2x4
6	20.8	18.6	21.6	2x4
7	19.0	20.4	22.7	2x4
8				
9				
10				

OVERALL TEST FUEL LOAD MOISTURE AVERAGE: 20.61 %

Time (clock): 09:00 Room Temperature (F): 70 Initials: K

Technician signature: K. Morgan Date: 2-27-07

OMNI-Test Laboratories, Inc.
Beaverton, OR

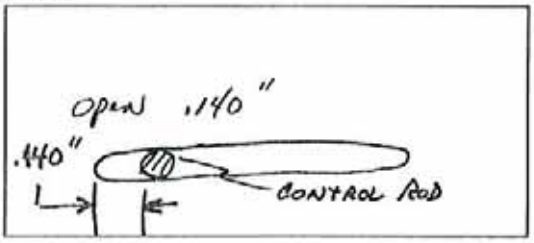
Run Notes

Client/Model: Harman Stove Company
Model: Large Wood Stove
Project #: 135-S-18-3
Tracking Number: 984
Run #: 2 Date: 2-27-07
Test Crew: K. Morgan
OMNI Equipment ID Numbers: _____

PREBURN

DESCRIBE OR SKETCH AIR OR THERMOMSTAT SETTINGS BELOW: (SETTINGS MUST BE ACCURATE AND REPRODUCABLE)

PRIMARY:



SECONDARY: FIXED

TERTIARY: NONE

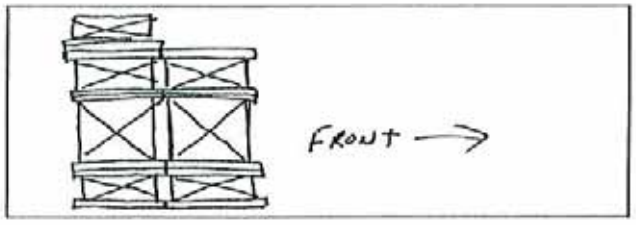
FAN: ON - LOW

PREBURN SETTINGS AND ACTIVITIES

TIME	AIR (THERMO) CHANGES PRIMARY/SECONDARY/TERTIARY	FAN SETTING CHANGE	ADD FUEL + WT.	ADD FUEL - WT.	RAKE COAL	COMMENT
0	TEST setting					
75					X	STIR
168					X	Levelled

TEST

TEST FUEL CONFIGURATION SKETCH
(INDICATE VIEW ANGLE)



START UP PROCEDURES

BYPASS: Not Used
FUEL LOADING Loaded by 50 sec.
DOOR: Closed at 55 sec.
PRIMARY AIR: Fully open 5:0 min - test setting at 5:0 min
OTHER: NONE

DESCRIBE OR SKETCH TEST SETTINGS BELOW: (SETTINGS MUST BE ACCURATE AND REPRODUCIBLE)

PRIMARY:

SAME AS ABOVE

SECONDARY: FIXED

TERTIARY: NONE

FAN: ON - LOW

Technician signature: K. J. Morgan Date: 2-27-07

OMNI-Test Laboratories, Inc.
Beaverton, OR

Supplemental Data EPA 5G/5H

Client: Harman Stove Company

Model: Large Wood Stove

Project No.: 135-S-18-3 Tracking No.: 984

Date: 2-27-07 Run No.: 2 Booth: 1

Test Crew: K. Morgan Start Time: 13:38 Stop Time: 22:28

OMNI Equipment #'s: _____

Gas Analyzer Train Leak Check:

Stack: Dilution Tunnel (Method 5G Only):

Initial: _____ Initial: _____

Final: N/A Final: N/A

Calibrations: Span Gas CO_2: N/A O_2: N/A CO: N/A CO_2(DT): N/A

	N_2 Span	N_2 Span	N_2 Span	N_2 Span	N_2 Span	N_2 Span	N_2 Span
Time							
O_2							
CO_2			N/A				
CO							
CO_2 (DT)							

Stack Diameter (inches): 6.0

Air Velocity (ft/min): Initial: < 50 Final: < 50

Scale Audit (lbs.): Pretest: 10.0 Post Test: 10.0

Induced Draft: Ø %Smoke Capture: 100

Pitot Tube Leak Test: Pre: Ø @ 3.2" W.C. Post: Ø @ 3.1" W.C.

Flue Pipe Cleaned Prior to First Test in Series: Date: 2-23-07 Initials: K

	Initial	Middle	Ending
Pb (in. Hg)	29.14	29.21	29.28
Room Temp (°F)	80	78	76

Technician signature: K. Morgan Date: 2-27-07

Run 3

OMNI-Test Laboratories, Inc.

Wood Heater Test Data - EPA Method 5G

Manufacturer: Harman Stove Company
Model: Large Wood Stove
Project No.: 984
Tracking No.: 135-S-18-3
Run: 3
Test Date: 02/28/07

Burn Rate	0.93 kg/hr dry
Particulate Concentration (dry-standard) Particulate Emission Rate Adjusted Emissions	0.00006 grams/dscf 0.50 grams/hour 1.02 grams/hour
Average Tunnel Temperature	96 degrees Fahrenheit
Average Delta p	0.038 inches H20
Total Sample Volume - Vm Average Gas Meter Temperature Average Gas Velocity in Dilution Tunnel - vs Average Gas Flow Rate in Dilution Tunnel - Qsd Total Sample Volume (Standard Conditions) - Vms	264.06 cubic feet 84 degrees Fahrenheit 13.44 feet/second 8495.02 dscf/hour 247.94 dscf
Total Particulates - mn Average Delta H Total Time of Test	14.6 mg 0.85 inches H20 510 minutes

OMNI-Test Laboratories, Inc.

Wood Heater Test Data - EPA Method 5G

Run: 3

Manufacturer: Harman Stove Company
Model: Large Wood Stove
Tracking No.: 984
Project No.: 135-S-18-3
Test Date: 28-Feb-07
Beginning Clock Time: 13:00
Recording Interval: 10 min.
Total Sampling Time: 510 min.

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	
Initial dP	0.038	0.038	0.036	0.032	0.035	0.038	0.037	0.036	"H2O
Initial Temp.	105	105	105	105	104	104	104	104	oF

OMNI Equipment Numbers: Adjusted fuel load at 460 minutes due to zero weight loss

PM Control Module: HAR-06
Dilution Tunnel MW(dry): 29.00 lb/lb-mole
Dilution Tunnel MW(wet): 28.56 lb/lb-mole
Dilution Tunnel H2O: 4.00 percent
Dilution Tunnel Static: -0.254 "H2O
Pitot Tube Cp: 0.99
Meter Box Y Factor: 0.983
Barometric Pressure: Begin 29.37, Middle 29.35, End 29.4, Average 29.37 "Hg

Signature/Date: H. J. Morgan 7-23-07

Tunnel Velocity: 13.44 ft/sec
Intial Tunnel Flow: 137.1 scfm
Average Tunnel Flow: 141.6 scfm
Tunnel Area: 0.1963 ft2
Post-Test Leak Check: 0 @ 8 cfm@"Hg
Fuel Moisture (dry basis): 21.33 %
Total Particulate: 14.6 mg
Filter Holder No.:

Elapsed Time	Particulate Sampling Data								Fuel Weight, lb		Wood Heater Temperature Data, oF											Stack	
	Gas Meter Cubic Feet	Sample Rate, cfm	Orifice dH	Meter oF	Meter Vac. In. Hg.	Dilution Tunnel Temp.	Dilution Tunnel dP	Pro. Rate (10%)	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Firebox Interior	Average Surface	Stack	Filter	Impinger exit	Ambient	Draft In. H2O	Catalyst Temp.
0	364.603		0.00	79	0	105	0.036		21.1		384	132	264	323	326		285.8	292	80	80	79	-0.042	
10	369.810	0.52	0.87	83	1	107	0.040	100	19.5	-1.6	316	132	337	314	316		283.0	359	82	55	80	-0.052	
20	375.000	0.52	0.87	83	1	106	0.040	100	18.5	-1	300	131	354	304	308		279.4	350	82	57	80	-0.052	
30	380.170	0.52	0.87	84	1	107	0.039	100	17.4	-1.1	309	131	361	296	298		279.0	354	81	56	80	-0.053	
40	385.350	0.52	0.87	84	1	106	0.040	99	16.2	-1.2	323	130	388	292	293		285.2	366	83	55	79	-0.053	
50	390.560	0.52	0.87	85	1	106	0.039	101	15.0	-1.2	345	130	393	293	293		290.8	370	83	55	80	-0.054	
60	395.730	0.52	0.87	85	1	107	0.039	100	13.9	-1.1	356	129	391	297	294		293.4	368	84	54	80	-0.053	
70	400.900	0.52	0.87	85	1	108	0.039	100	12.8	-1.1	350	130	386	306	295		293.4	363	83	55	81	-0.052	
80	406.080	0.52	0.87	85	1	107	0.039	100	11.9	-0.9	346	130	368	316	296		291.2	349	83	55	80	-0.050	
90	411.260	0.52	0.87	85	1	107	0.039	100	11.0	-0.9	347	130	368	326	296		293.4	358	83	54	81	-0.051	
100	416.450	0.52	0.87	85	1	106	0.039	100	10.0	-1	357	130	378	340	298		300.6	362	84	54	81	-0.051	
110	421.630	0.52	0.87	85	1	107	0.039	100	9.1	-0.9	368	130	372	354	302		305.2	358	84	54	81	-0.050	
120	426.810	0.52	0.87	86	1	107	0.040	99	8.2	-0.9	378	130	370	367	307		310.4	358	84	54	81	-0.050	
130	432.000	0.52	0.87	86	1	106	0.038	102	7.3	-0.9	388	130	369	375	312		314.8	356	84	54	81	-0.050	
140	437.165	0.52	0.87	86	1	106	0.039	100	6.6	-0.7	393	130	366	381	317		317.4	350	84	54	81	-0.048	
150	442.350	0.52	0.87	86	1	106	0.039	100	6.1	-0.5	391	131	382	382	322		321.6	319	84	54	81	-0.044	
160	447.515	0.52	0.87	86	1	103	0.039	99	5.7	-0.4	382	131	276	377	322		297.6	292	83	54	81	-0.040	
170	452.705	0.52	0.87	86	1	101	0.039	100	5.4	-0.3	369	132	253	370	318		288.4	286	83	53	81	-0.040	
180	457.890	0.52	0.87	86	1	101	0.038	101	5.1	-0.3	360	132	246	362	314		282.8	278	82	53	80	-0.039	
190	463.070	0.52	0.87	86	1	101	0.039	100	4.9	-0.2	354	132	238	357	311		278.4	273	82	53	80	-0.037	NA
200	468.250	0.52	0.87	85	1	99	0.039	100	4.6	-0.3	352	133	232	351	308		275.2	268	82	53	80	-0.037	NA
210	473.440	0.52	0.87	85	1	98	0.039	100	4.4	-0.2	349	133	227	346	307		272.4	264	82	53	80	-0.036	NA
220	478.605	0.52	0.87	85	1	98	0.039	99	4.1	-0.3	348	133	218	341	306		269.2	256	81	53	80	-0.035	NA
230	483.790	0.52	0.87	85	1	97	0.039	100	3.8	-0.3	346	132	219	334	305		267.2	262	81	52	80	-0.035	NA
240	488.960	0.52	0.87	85	1	97	0.039	99	3.5	-0.3	343	132	223	326	305		265.8	263	81	53	80	-0.036	NA
250	494.130	0.52	0.87	85	1	98	0.038	101	3.3	-0.2	342	132	226	321	305		265.2	261	81	52	79	-0.036	NA
260	499.300	0.52	0.87	85	1	96	0.038	100	3.0	-0.3	341	132	224	316	308		264.2	258	81	52	79	-0.035	NA
270	504.470	0.52	0.87	85	1	97	0.038	101	2.8	-0.2	337	133	219	312	310		262.2	251	80	53	79	-0.034	NA
280	509.640	0.52	0.87	85	1	95	0.038	100	2.6	-0.2	351	132	207	307	313		262.0	238	81	52	79	-0.032	NA
290	514.850	0.52	0.87	84	1	95	0.038	101	2.4	-0.2	353	131	194	305	315		259.6	230	80	52	79	-0.031	NA
300	520.050	0.52	0.87	84	1	94	0.038	101	2.3	-0.1	348	132	186	303	313		256.4	225	79	52	78	-0.030	NA
310	525.270	0.52	0.87	84	1	92	0.038	101	2.1	-0.2	343	132	178	299	312		252.8	218	80	52	79	-0.029	NA
320	530.430	0.52	0.87	84	1	93	0.038	100	2.0	-0.1	338	131	171	294	309		248.6	211	80	52	79	-0.028	NA
330	535.645	0.52	0.87	84	1	91	0.037	102	1.9	-0.1	333	131	165	290	305		244.8	205	80	52	79	-0.027	NA
340	540.830	0.52	0.87	83	1	90	0.039	99	1.8	-0.1	327	131	159	285	301		240.6	199	80	52	78	-0.026	NA
350	545.980	0.51	0.87	83	1	91	0.037	101	1.7	-0.1	315	130	153	279	297		234.8	193	79	52	78	-0.025	NA
360	551.175	0.52	0.87	83	1	90	0.038	101	1.5	-0.2	315	130	153	279	297		234.8	193	79	52	78	-0.024	NA
370	556.385	0.52	0.87	83	1	89	0.038	101	1.4	-0.1	297	128	141	267	286		223.8	179	78	52	77	-0.023	NA
380	561.540	0.52	0.87	83	1	88	0.037	101	1.3	-0.1	289	127	136	261	281		218.8	174	78	52	78	-0.022	NA

OMNI-Test Laboratories, Inc.

Wood Heater Test Data - EPA Method 5G

Run: 3

Manufacturer:	Harman Stove Company
Model:	Large Wood Stove
Tracking No.:	984
Project No.:	135-S-18-3
Test Date:	28-Feb-07
Beginning Clock Time:	13:00
Recording Interval:	10 min.
Total Sampling Time:	510 min.

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	
Initial dP	0.038	0.038	0.036	0.032	0.035	0.038	0.037	0.036	"H2O
Initial Temp.	105	105	105	105	104	104	104	104	oF

OMNI Equipment Numbers: Adjusted fuel load at 460 minutes due to zero weight loss

PM Control Module:	HAR-06
Dilution Tunnel MW(dry):	29.00 lb/lb-mole
Dilution Tunnel MW(wet):	28.56 lb/lb-mole
Dilution Tunnel H2O:	4.00 percent
Dilution Tunnel Static:	-0.254 "H2O
Pitot Tube Cp:	0.99
Meter Box Y Factor:	0.983

Barometric Pressure:	Begin	Middle	End	Average
	29.37	29.35	29.4	29.37 "Hg

Signature/Date: K. J. Marx 7-23-07

Tunnel Velocity:	13.44	ft/sec.
Intial Tunnel Flow:	137.1	scfm
Average Tunnel Flow:	141.6	scfm
Tunnel Area:	0.1963	ft2
Post-Test Leak Check:	0 @ 8	cfm@"Hg
Fuel Moisture (dry basis):	21.33	%
Total Particulate:	14.6	mg
Filter Holder No.:		

Elapsed Time	Particulate Sampling Data								Fuel Weight, lb		Wood Heater Temperature Data, oF											Stack	
	Gas Meter Cubic Feet	Sample Rate, cfm	Orifice dH	Meter oF	Meter Vac. In. Hg	Dilution Tunnel Temp.	Dilution Tunnel dP	Pro. Rate (10%)	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Firebox Interior	Average Surface	Stack	Filter	Impinger exit	Ambient	Draft In H2O	Catalyst Temp.
390	566.730	0.52	0.87	83	1	87	0.036	103	1.2	-0.1	282	126	133	255	279		215.0	169	77	52	77	-0.021	NA
400	571.920	0.52	0.87	83	1	87	0.037	102	1.1	-0.1	273	125	129	249	274		210.0	166	77	52	77	-0.020	NA
410	577.110	0.52	0.87	83	1	87	0.036	103	1.0	-0.1	264	123	127	241	269		204.8	161	76	52	77	-0.019	NA
420	582.310	0.52	0.87	82	1	85	0.037	102	1.0	0	256	122	124	235	264		200.2	158	77	53	77	-0.019	NA
430	587.490	0.52	0.87	82	1	85	0.037	102	0.9	-0.1	247	120	122	228	259		195.2	154	76	53	77	-0.018	NA
440	592.695	0.52	0.87	82	1	84	0.037	102	0.8	-0.1	237	119	118	223	253		190.0	149	76	53	77	-0.017	NA
450	597.880	0.52	0.87	82	1	84	0.036	103	0.7	-0.1	230	117	116	217	247		185.4	146	76	53	77	-0.017	NA
460	603.050	0.52	0.87	81	1	83	0.036	103	0.7	0	221	115	115	211	241		180.6	142	75	53	77	-0.016	NA
470	608.060	0.50	0.87	81	1	84	0.036	100	0.5	-0.2	218	113	112	204	236		176.6	139	75	54	75	-0.014	NA
480	613.190	0.51	0.87	81	1	82	0.037	100	0.4	-0.1	221	112	111	202	236		176.4	139	75	53	76	-0.015	NA
490	618.340	0.51	0.87	81	1	83	0.036	102	0.2	-0.2	221	109	110	198	234		174.4	136	74	54	75	-0.014	NA
500	623.475	0.51	0.87	81	1	82	0.036	102	0.1	-0.1	219	108	108	196	231		172.4	135	74	53	75	-0.014	NA
510	628.666	0.52	0.87	81	1	82	0.036	103	0.0	-0.1	215	106	108	193	228		170.0	133	74	54	75	-0.014	NA
Avg/Total	264.063	0.52	0.85	83.83		96.01	0.04	100.71									116		80.06	53.75		-0.03	#DIV/0!

OMNI-Test Laboratories, Inc.

Final Laboratory Report - Method 5G
Dilution Tunnel Particulate Calculations

Client Name: Harman Stove Company
Model: Large Wood Stove
Project No.: 135-S-18-3
Tracking No.: 984

Equipment Numbers:

Run #: 3
Date: 02/28/07

Sample Component	Reagent	Filter # or Volume, ml	Weights			
			Final, mg	Tare, mg	Blank, mg/ml	Particulate, mg
A. Front filter catch	Filter	3A	611.4	606.0		5.4
B. Rear filter catch	Filter	3B	602.2	602.0		0.2
C. Rinse of probe and filter assembly	Acetone	125	117165.1	117155.5	0.0045	9.0

Total Particulate, mg :	14.6

Component	Equations:
A. Front filter catch	Final (mg) - Tare (mg) = Particulate, mg
B. Rear filter catch	Final (mg) - Tare (mg) = Particulate, mg
C. Rinse of probe and filter assembly	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg

Analyst: H. L. Morgan Date: 3-12-07

OMNI Test Laboratories
Beaverton, OR Phone (503) 643-3788

STOVE TEMPERATURE TEST DATA - METHOD 5G R & D

Client/Model: _Harman Stove Company / Large Wood Stove **Project #:** 135-S-18.3 **Tracking #:** 984

Date: 2-28-07 Test Crew: K. Morgan Run #: 3

OMNI Equipment ID #:

Preburn [X] Test [ ]

Coal Bed: Data: 0 = Range: 4.3 - 5.2

Actual: Coal Bed: 4.8

Time	Fuel Weight	Delta Weight	Stack Draft	TEMPERATURES (oF) Ambient	Top	Bottom	Back	Left	Right	Flue	~~Catalyst~~ No+ Used	% GASES O2	CO2	CO
0	14.9		-.068	72	307	104	424	230	218	484				
10	13.8	1.1	-.057	74	301	114	423	253	248	377				
20	12.8	1.0	-.054	75	305	120	390	260	260	358				
30	11.9	0.9	-.053	77	309	122	381	264	265	352				
40	11.1	0.8	-.050	78	317	124	360	268	280	341				
50	10.3	0.8	-.051	78	329	124	357	272	294	342				
60	9.5	0.8	-.049	79	340	124	355	277	307	336				
70	8.8	0.7	-.047	79	351	123	346	282	315	323				
80	8.0	0.8	-.053	79	361	125	315	288	318	398				
90	7.1	0.9	-.053	80	365	126	392	296	323	374				
00	6.3	0.8	-.050	80	385	128	400	307	335	351				
10	5.9	0.4	-.046	80	395	128	358	312	346	323				
20	5.5	0.4	-.043	80	388	128	314	316	342	302				
30	5.2	0.3	-.039	80	378	129	277	320	333	282				
40	4.8	0.4	-.045	80	385	131	256	321	326	316				
50														
60														
70														
80														
90														
AVG														

Technician signature: K. J. Morgan Date: 2-28-07

A-25 OF A-54

OMNI-Test Laboratories, Inc.
Beaverton, OR

FUEL DATA

Client: Harman Stove Company
Model: Large Wood Stove
Project #: 135-S-18-3 Tracking #: 984
Date: 2-28-07 Test Crew: K. Morgan Run #: 3
OMNI Equipment ID #:
FUEL LOAD PREPARED BY: K. Morgan
FUEL: DOUGLAS-FIR SPECIES, UNTREATED, AIR-DRIED, STANDARD GRADE OR BETTER, DIMENSIONAL LUMBER.

PRE-BURN FUEL

MOISTURE CONTENT (METER -- DRY BASIS)

CALIBRATION: Cal Value (1) = 12% Actual Reading 12.0
Cal Value (2) = 22% Actual Reading 22.0

Piece	Length	Readings			Type
1	8 ft	20.9	22.1	23.8	2x4
2	8 ft	24.5	23.2	21.9	2x4
3	3 ft	24.2	21.1	23.8	2x4

Length of cut pieces: 25 @ 8" inches Pre-Burn Fuel Average Moisture: 22.83%

Time (clock): 09:10 Room Temperature (F): 71 Initials: K

TEST FUEL

FUEL TYPE AND AMOUNT: 2 × 4 5 4 × 4 2
CALCULATED LOAD WEIGHT: ACTUAL LOAD WEIGHT: 16.2 (2 × 4)
9.8 (4 × 4)
FUEL PIECE LENGTH: 17.0" 21.4 Total

MOISTURE CONTENT (METER -- DRY BASIS)

PIECE	READINGS			TYPE
1	20.0	19.9	20.2	2x4
2	23.1	20.8	23.4	2x4
3	22.2	21.5	19.9	2x4
4	21.9	19.5	19.9	2x4
5	20.6	19.1	19.2	2x4
6	22.3	22.6	22.1	4x4
7	23.8	23.8	22.1	4x4
8				
9				
10				

OVERALL TEST FUEL LOAD MOISTURE AVERAGE: 21.33%

Time (clock): 09:00 Room Temperature (F): 71 Initials: K

Technician signature: K. Morgan Date: 2-28-07

OMNI-Test Laboratories Inc.
Beaverton, OR

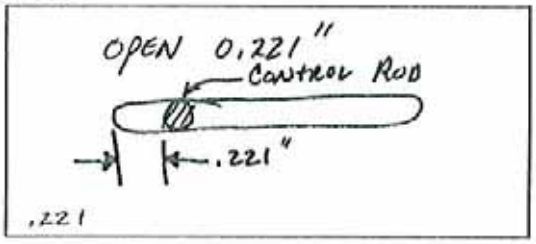
Run Notes

Client/Model: Harman Stove Company
Model: Large Wood Stove
Project #: 135-S-18-3
Tracking Number: 984
Run #: 3 Date: 2-28-07
Test Crew: K. Morgan
OMNI Equipment ID Numbers: _____

PREBURN

DESCRIBE OR SKETCH AIR OR THERMOMSTAT SETTINGS BELOW: (SETTINGS MUST BE ACCURATE AND REPRODUCABLE)

PRIMARY:



SECONDARY: FIXED

TERTIARY: NONE

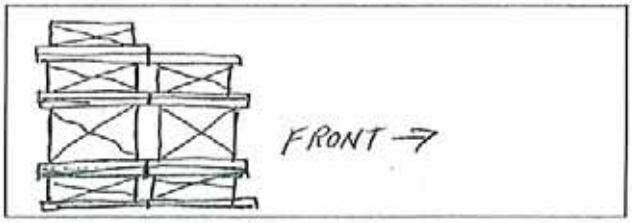
FAN: ON-LOW

PREBURN SETTINGS AND ACTIVITIES

TIME	AIR (THERMO) CHANGES PRIMARY/SECONDARY/TERTIARY	FAN SETTING CHANGE	ADD FUEL + WT.	ADD FUEL - WT.	RAKE COAL	COMMENT
0	test setting					
80					X	STIR
130					X	Level bed

TEST

TEST FUEL CONFIGURATION SKETCH
(INDICATE VIEW ANGLE)



START UP PROCEDURES

BYPASS: N/A
FUEL LOADING: Loaded by 70 sec.
DOOR: Closed at 80 sec
PRIMARY AIR: Full open 5:10 MIN
Abruptly closed to test setting at 5:10 MIN
OTHER: NONE

DESCRIBE OR SKETCH TEST SETTINGS BELOW: (SETTINGS MUST BE ACCURATE AND REPRODUCIBLE)

PRIMARY:

SAME AS ABOVE

SECONDARY: FIXED

TERTIARY: NONE

FAN: ON-LOW

Technician signature: K. A. Morgan Date: 2-28-07

OMNI-Test Laboratories, Inc.
Beaverton, OR

Supplemental Data EPA 5G/5H

Client: Harman Stove Company

Model: Large Wood Stove

Project No.: 135-S-18-3 Tracking No.: 984

Date: 2-28-07 Run No.: 3 Booth: 1

Test Crew: K. Morgan Start Time: 13:00 Stop Time: 21:30

OMNI Equipment #'s: _____

Gas Analyzer Train Leak Check:

Stack: Dilution Tunnel (Method 5G Only):

Initial: _____ Initial: _____

Final: N/A Final: N/A

Calibrations: Span Gas CO_2: N/A O_2: N/A CO: N/A CO_2(DT): N/A

	N_2 Span	N_2 Span	N_2 Span	N_2 Span	N_2 Span	N_2 Span	N_2 Span
Time							
O_2			N/A				
CO_2							
CO							
CO_2 (DT)							

Stack Diameter (inches): 6.0

Air Velocity (ft/min): Initial: <50 Final: <50

Scale Audit (lbs.): Pretest: 10.0 Post Test: 10.0

Induced Draft: 0 %Smoke Capture: 100

Pitot Tube Leak Test: Pre: 0 @ 3.1 "W.C. Post: 0 @ 3.2" W.C.

Flue Pipe Cleaned Prior to First Test in Series: Date: 2-23-07 Initials: K

	Initial	Middle	Ending
Pb (in. Hg)	29.37	29.35	29.40
Room Temp (°F)	79	79	75

Technician signature: K. Morgan Date: 2-28-07

Run 4

OMNI-Test Laboratories, Inc.

Wood Heater Test Data - EPA Method 5G

Manufacturer: Harman Stove Company
Model: Large Woodstove
Project No.: 984
Tracking No.: 135-S-18-3
Run: 4
Test Date: 03/01/07

Burn Rate	1.03 kg/hr dry
Particulate Concentration (dry-standard) Particulate Emission Rate Adjusted Emissions	0.00005 grams/dscf 0.46 grams/hour 0.96 grams/hour
Average Tunnel Temperature	104 degrees Fahrenheit
Average Delta p	0.039 inches H20
Total Sample Volume - Vm Average Gas Meter Temperature Average Gas Velocity in Dilution Tunnel - vs Average Gas Flow Rate in Dilution Tunnel - Qsd Total Sample Volume (Standard Conditions) - Vms	238.80 cubic feet 84 degrees Fahrenheit 13.69 feet/second 8465.84 dscf/hour 222.76 dscf
Total Particulates - mn Average Delta H Total Time of Test	12.2 mg 0.85 inches H20 460 minutes

OMNI-Test Laboratories, Inc.

Wood Heater Test Data - EPA Method 5G

Run: 4

Manufacturer:	Harman Stove Company
Model:	Large Woodstove
Tracking No.:	984
Project No.:	135-S-18-3
Test Date:	01-Mar-07
Beginning Clock Time:	12:38
Recording Interval:	10 min.
Total Sampling Time:	460 min.

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	
Initial dP	0.036	0.038	0.036	0.033	0.036	0.038	0.038	0.038	"H2O
Initial Temp	113	113	113	113	113	113	113	113	oF

OMNI Equipment Numbers:

PM Control Module:	HAR-06
Dilution Tunnel MW(dry):	29.00 lb/lb-mole
Dilution Tunnel MW(wet):	28.56 lb/lb-mole
Dilution Tunnel H2O:	4.00 percent
Dilution Tunnel Static:	-0.256 "H2O
Pitot Tube Cp:	0.99
Meter Box Y Factor:	0.983

Barometric Pressure:	Begin	Middle	End	Average
	29.25	29.18	29.12	29.18 "Hg

Signature/Date: 7-25-07

Tunnel Velocity:	13.69	ft/sec.
Initial Tunnel Flow:	136.4	scfm
Average Tunnel Flow:	141.1	scfm
Tunnel Area:	0.1963	ft2
Post-Test Leak Check:	.001 @ 9	cfm@"Hg
Fuel Moisture (dry basis:	22.21	%
Total Particulate:	12.2	mg
Filter Holder No.:		

Elapsed Time	Particulate Sampling Data								Fuel Weight, lb		Wood Heater Temperature Data, oF											Stack	
	Gas Meter Cubic Feet	Sample Rate, cfm	Orifice dH	Meter oF	Meter Vac. In. Hg.	Dilution Tunnel Temp.	Dilution Tunnel dP	Pro. Rate (10%)	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Firebox Interior	Average Surface	Stack	Filter	Impinger exit	Ambient	Draft In. H2O	Catalyst Temp.
0	629.003		0.00	83	0	113	0.037		21.3		435	143	395	336	369		335.6	296	81	81	81	-0.040	
10	634.100	0.51	0.87	82	1	113	0.039	99	19.7	-1.6	377	144	473	326	356		335.2	369	85	59	81	-0.052	
20	639.195	0.51	0.87	83	1	111	0.039	99	18.6	-1.1	346	143	495	314	348		329.2	367	84	62	81	-0.054	
30	644.360	0.52	0.87	83	1	113	0.038	102	17.3	-1.3	338	143	531	303	344		331.8	388	83	65	81	-0.056	
40	649.530	0.52	0.87	83	1	115	0.038	102	16.1	-1.2	338	140	575	298	346		339.4	391	85	65	81	-0.056	
50	654.790	0.53	0.87	83	1	115	0.039	103	14.9	-1.2	342	139	589	296	353		343.8	394	86	64	80	-0.055	
60	659.860	0.51	0.87	84	1	116	0.039	99	13.9	-1	347	139	584	297	366		346.6	389	86	59	82	-0.054	
70	664.995	0.51	0.87	84	1	116	0.039	100	12.8	-1.1	358	138	579	298	379		350.4	398	87	56	81	-0.056	
80	670.150	0.52	0.87	85	1	118	0.038	102	11.6	-1.2	374	138	594	302	392		360.0	408	88	54	82	-0.057	
90	675.310	0.52	0.87	85	1	119	0.039	101	10.5	-1.1	395	138	596	308	405		368.4	405	88	54	82	-0.055	
100	680.470	0.52	0.87	85	1	119	0.040	99	9.4	-1.1	413	138	597	314	416		375.6	413	88	53	83	-0.056	
110	685.635	0.52	0.87	85	1	120	0.040	100	8.3	-1.1	427	138	606	320	425		383.2	406	88	54	83	-0.053	
120	690.780	0.51	0.87	85	1	119	0.039	100	7.4	-0.9	436	139	600	327	431		386.6	392	89	54	83	-0.052	
130	695.980	0.52	0.87	85	1	115	0.038	102	6.8	-0.6	444	139	572	330	432		383.4	373	89	54	83	-0.050	
140	701.180	0.52	0.87	86	1	114	0.039	101	6.3	-0.5	443	139	530	331	430		374.6	356	89	54	82	-0.049	
150	706.380	0.52	0.87	86	1	113	0.039	101	5.8	-0.5	438	140	495	332	423		365.6	348	87	53	83	-0.048	
160	711.585	0.52	0.87	86	1	113	0.040	100	5.4	-0.4	438	141	480	333	414		361.2	340	86	54	83	-0.045	
170	716.790	0.52	0.87	86	1	111	0.039	101	5.0	-0.4	441	140	458	334	406		355.8	327	87	53	83	-0.045	
180	721.995	0.52	0.87	86	1	110	0.039	101	4.6	-0.4	446	140	436	335	398		351.0	321	87	53	83	-0.043	
190	727.199	0.52	0.87	86	1	109	0.040	99	4.3	-0.3	449	140	428	335	393		349.0	319	87	53	83	-0.043	NA
200	732.420	0.52	0.87	86	1	108	0.039	101	4.0	-0.3	447	140	416	335	386		344.8	308	86	53	82	-0.042	NA
210	737.615	0.52	0.87	86	1	107	0.039	100	3.7	-0.3	441	140	402	334	381		339.6	303	86	53	82	-0.041	NA
220	742.820	0.52	0.87	86	1	106	0.040	99	3.4	-0.3	433	139	387	332	376		333.4	291	85	53	82	-0.039	NA
230	748.030	0.52	0.87	85	1	105	0.039	100	3.2	-0.2	425	139	370	329	370		326.6	282	85	54	82	-0.037	NA
240	753.240	0.52	0.87	85	1	102	0.039	100	3.0	-0.2	420	139	354	327	364		320.8	274	85	53	81	-0.036	NA
250	758.450	0.52	0.87	85	1	103	0.039	100	2.9	-0.1	416	139	336	325	356		314.4	265	84	54	82	-0.034	NA
260	763.660	0.52	0.87	85	1	100	0.039	100	2.7	-0.2	416	139	326	324	351		311.2	263	85	53	81	-0.034	NA
270	768.875	0.52	0.87	85	1	100	0.038	101	2.5	-0.2	411	139	316	323	347		307.2	258	83	53	81	-0.035	NA
280	774.085	0.52	0.87	84	1	99	0.039	100	2.3	-0.2	407	138	308	319	341		302.6	253	83	53	81	-0.034	NA
290	779.260	0.52	0.87	84	1	99	0.040	98	2.2	-0.1	399	137	300	318	336		298.0	250	82	53	81	-0.033	NA
300	784.465	0.52	0.87	84	1	98	0.038	101	2.1	-0.1	393	136	296	314	331		294.0	246	83	53	80	-0.033	NA
310	789.680	0.52	0.87	84	1	98	0.039	100	1.9	-0.2	385	135	290	311	327		289.6	243	82	54	81	-0.032	NA
320	794.875	0.52	0.87	84	1	98	0.039	100	1.7	-0.2	381	134	286	308	323		286.4	240	82	53	81	-0.031	NA
330	800.085	0.52	0.87	83	1	96	0.038	101	1.6	-0.1	382	133	281	306	318		284.0	237	82	53	80	-0.031	NA
340	805.365	0.53	0.87	83	1	95	0.038	103	1.4	-0.2	376	132	276	304	312		280.0	233	82	53	80	-0.031	NA
350	810.550	0.52	0.87	83	1	96	0.038	101	1.3	-0.1	369	132	270	302	307		276.0	227	82	54	80	-0.029	NA
360	815.700	0.52	0.87	83	1	95	0.037	101	1.1	-0.2	364	130	265	301	302		272.4	224	81	54	80	-0.030	NA
370	820.910	0.52	0.87	82	1	94	0.038	101	1.0	-0.1	359	130	257	299	297		268.4	219	81	54	80	-0.029	NA
380	826.115	0.52	0.87	82	1	94	0.037	103	0.9	-0.1	353	128	251	296	292		264.0	215	80	54	79	-0.028	NA

OMNI-Test Laboratories, Inc.

Wood Heater Test Data - EPA Method 5G

Run:	4
Manufacturer:	Harman Stove Company
Model:	Large Woodstove
Tracking No.:	984
Project No.:	135-S-18-3
Test Date:	01-Mar-07
Beginning Clock Time:	12:38
Recording Interval:	10 min.
Total Sampling Time:	460 min.

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	
Initial dP	0.036	0.038	0.036	0.033	0.036	0.038	0.038	0.038	"H2O
Initial Temp.	113	113	113	113	113	113	113	113	oF

OMNI Equipment Numbers:

PM Control Module:	HAR-06
Dilution Tunnel MW(dry):	29.00 lb/lb-mole
Dilution Tunnel MW(wet):	28.56 lb/lb-mole
Dilution Tunnel H2O:	4.00 percent
Dilution Tunnel Static:	-0.256 "H2O
Pitot Tube Cp:	0.99
Meter Box Y Factor:	0.983

Barometric Pressure:

Begin	Middle	End	Average
29.25	29.18	29.12	29.18 "Hg

Signature/Date: K. J. Meyer 7-23-07

Tunnel Velocity:	13.69	ft/sec.
Initial Tunnel Flow:	136.4	scfm
Average Tunnel Flow:	141.1	scfm
Tunnel Area:	0.1963	ft2
Post-Test Leak Check:	.001 @ 9	cfm@"Hg
Fuel Moisture (dry basis	22.21	%
Total Particulate:	12.2	mg
Filter Holder No.:		

Elapsed Time	Particulate Sampling Data								Fuel Weight, lb		Wood Heater Temperature Data, oF											Stack	
	Gas Meter Cubic Feet	Sample Rate, cfm	Orifice dH	Meter oF	Meter Vac. In. Hg	Dilution Tunnel Temp.	Dilution Tunnel dP	Pro. Rate (10%)	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Firebox Interior	Average Surface	Stack	Filter	Impinger exit	Ambient	Draft In H2O	Catalyst Temp.
390	831.345	0.52	0.87	82	1	93	0.038	102	0.8	-0.1	347	127	244	295	286		259.8	210	80	54	79	-0.027	NA
400	836.570	0.52	0.87	82	1	92	0.038	101	0.6	-0.2	342	125	237	291	281		255.2	205	80	53	79	-0.028	NA
410	841.720	0.51	0.87	82	1	92	0.037	101	0.5	-0.1	336	123	231	289	275		250.8	200	79	53	78	-0.026	NA
420	846.920	0.52	0.87	81	1	91	0.037	102	0.4	-0.1	328	121	224	286	269		245.6	195	79	53	78	-0.025	NA
430	852.135	0.52	0.87	81	1	90	0.038	101	0.3	-0.1	320	120	219	283	262		240.8	191	79	53	78	-0.025	NA
440	857.350	0.52	0.87	81	1	90	0.038	101	0.2	-0.1	312	118	213	278	257		235.6	187	78	53	78	-0.024	NA
450	862.550	0.52	0.87	81	1	88	0.039	99	0.1	-0.1	306	117	208	273	251		231.0	183	78	53	78	-0.024	NA
460	867.802	0.53	0.87	81	1	89	0.038	102	0.0	-0.1	300	116	203	269	246		226.8	180	78	53	77	-0.024	NA
Avg/Total	238.799	0.52	0.85	83.85		104.47	0.039	100.70									109		83.83	55.17		-0.040	#DIV/0!

OMNI-Test Laboratories, Inc.

Final Laboratory Report - Method 5G
Dilution Tunnel Particulate Calculations

Client Name: Harman Stove Company
Model: Large Wood Stove
Project No.: 135-S-18-3
Tracking No.: 984

Equipment Numbers:

Run #: 4
Date: 03/01/07

Sample Component	Reagent	Filter # or Volume, ml	Weights			
			Final, mg	Tare, mg	Blank, mg/ml	Particulate, mg
A. Front filter catch	Filter	4A	609.0	602.0		7.0
B. Rear filter catch	Filter	4B	604.7	604.4		0.3
C. Rinse of probe and filter assembly	Acetone	125	100683.2	100677.7	0.0045	4.9

Total Particulate, mg :	12.2

Component	Equations:
A. Front filter catch	Final (mg) - Tare (mg) = Particulate, mg
B. Rear filter catch	Final (mg) - Tare (mg) = Particulate, mg
C. Rinse of probe and filter assembly	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg

Analyst: H. J. Morgan Date: 3-12-07

OMNI Test Laboratories
Beaverton, OR Phone (503) 643-3788

STOVE TEMPERATURE TEST DATA - METHOD 5G R & D

Client/Model: _Harman Stove Company / Large Wood Stove **Project #:** 135-S-18.3 **Tracking #:** 984

Date: 3-01-07 Test Crew: K. Morgan Run #: K*4 FAN - confirm

OMNI Equipment ID #:

Preburn [X] Test [ ] Coal Bed: Data: 0 = Range: 4.3-5.3 Actual: Coal Bed: 4.8

Time	Fuel Weight	Delta Weight	Stack Draft	TEMPERATURES (oF) Ambient	Top	Bottom	Back	Left	Right	Flue	Not Used Catalyst	% GASES O2	CO2	CO
0	15.1		-.071	73	304	88	649	232	264	520				
10	13.8	1.3	-.062	75	322	97	654	261	290	417				
20	12.8	1.0	-.058	76	340	105	615	281	304	396				
30	11.9	0.9	-.056	76	353	112	587	293	312	382				
40	11.0	0.9	-.056	78	359	117	577	300	318	382				
50	10.0	1.0	-.056	77	370	120	582	306	326	384				
60	9.1	0.9	-.056	79.1	379	123	590	313	337	383				
70	8.2	0.9	-.054	79	390	126	589	319	348	378				
80	7.4	0.8	-.053	80	398	127	574	325	357	369				
90	6.9	0.5	-.049	79	403	130	535	330	366	345				
00	6.5	0.4	-.047	79	402	132	496	333	372	347				
10	5.9	0.6	-.053	80	418	134	470	333	376	399				
20	5.5	0.4	-.048	81	432	137	516	338	384	342				
30	5.3	0.2	-.044	80	441	138	486	341	385	319				
40	5.1	0.2	-.042	81	443	140	445	341	381	299				
50	4.9	0.2	-.040	81	440	142	410	339	375	287				
~~57.60~~	4.8	0.1	-.040	81	437	143	395	337	370	296				
70														
80														
90														
AVG														

Technician signature: K. J. Morgan Date: 3-01-07

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OMNI-Test Laboratories, Inc.
Beaverton, OR

FUEL DATA

Client: Harman Stove Company
Model: Large Wood Stove
Project #: 135-S-18-3 Tracking #: 984
Date: 3-01-07 Test Crew: K. Morgan Run #: 4
OMNI Equipment ID #:
FUEL LOAD PREPARED BY: K. Morgan
FUEL: DOUGLAS-FIR SPECIES, UNTREATED, AIR-DRIED, STANDARD GRADE OR BETTER, DIMENSIONAL LUMBER.

PRE-BURN FUEL

MOISTURE CONTENT (METER -- DRY BASIS)

CALIBRATION: Cal Value (1) = 12% Actual Reading 12.0
Cal Value (2) = 22% Actual Reading 22.0

Piece	Length		Readings			Type
1	8 ft	24.9	24.6	22.0		2x4
2	8 ft	19.2	20.2	22.5		2x4
3	4 ft	20.2	20.1	20.6		2x4

Length of cut pieces: ~~16~~ 26 08" inches Pre-Burn Fuel Average Moisture: 21.59%

Time (clock): 08:45 Room Temperature (F): 71 Initials: JK

TEST FUEL

FUEL TYPE AND AMOUNT: 2 × 4 5 4 × 4 2
CALCULATED LOAD WEIGHT: ACTUAL LOAD WEIGHT: 11.4 (2 × 4)
9.9 (4 × 4)
FUEL PIECE LENGTH: 17.25" 21.3 Total

MOISTURE CONTENT (METER -- DRY BASIS)

PIECE	READINGS			TYPE
1	24.4	24.4	24.4	4x4
2	24.2	23.8	20.3	4x4
3	22.2	19.9	23.2	2x4
4	23.8	19.7	22.4	2x4
5	21.2	18.8	22.2	2x4
6	23.0	20.5	22.2	2x4
7	21.9	21.4	22.6	2x4
8				
9				
10				

OVERALL TEST FUEL LOAD MOISTURE AVERAGE: 22.21%

Time (clock): 08:30 Room Temperature (F): 70 Initials: JK

Technician signature: K. Morgan Date: 3-01-07

OMNI-Test Laboratories c.
Beaverton, OR

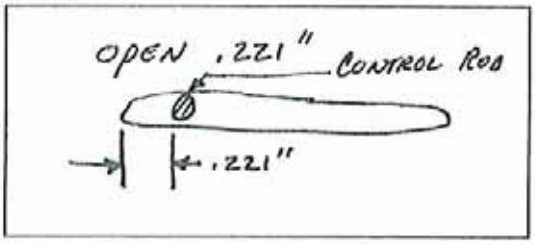
Run Notes

Client/Model: Harman Stove Company
Model: Large Wood Stove
Project #: 135-S-18-3
Tracking Number: 984
Run #: 4 Date: 3-01-07
Test Crew: K. Morgan
OMNI Equipment ID Numbers: _____

PREBURN

DESCRIBE OR SKETCH AIR OR THERMOMSTAT SETTINGS BELOW: (SETTINGS MUST BE ACCURATE AND REPRODUCABLE)

PRIMARY:



SECONDARY: FIXED

TERTIARY: NONE

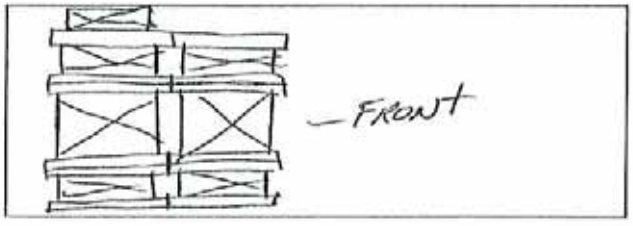
FAN: OFF - FAN CONFIRMATION

PREBURN SETTINGS AND ACTIVITIES

TIME	AIR (THERMO) CHANGES PRIMARY/SECONDARY/TERTIARY	FAN SETTING CHANGE	ADD FUEL + WT.	ADD FUEL - WT.	RAKE COAL	COMMENT
0	test setting					
106					X	STIR
150					X	levelled

TEST

TEST FUEL CONFIGURATION SKETCH
(INDICATE VIEW ANGLE)



START UP PROCEDURES

BYPASS: NOT USED
FUEL LOADING: Loaded by 50 sec.
DOOR: Closed At 60 sec.
PRIMARY AIR: Fully OPEN 5.0 min. Abruptly Closed at 5.0 min.
OTHER: NONE

DESCRIBE OR SKETCH TEST SETTINGS BELOW: (SETTINGS MUST BE ACCURATE AND REPRODUCIBLE)

PRIMARY:

SAME AS ABOVE

SECONDARY: FIXED

TERTIARY: NONE

FAN: OFF - FAN CONFIRMATION

Technician signature: K. A. Morgan Date: 3-01-07

OMNI-Test Laboratories, Inc.
Beaverton, OR

Supplemental Data EPA 5G/5H

Client: Harman Stove Company

Model: Large Wood Stove

Project No.: 135-S-18-3 Tracking No.: 984

Date: 3-01-07 Run No.: 4 Booth: 1

Test Crew: K. Morgan Start Time: 12:38 Stop Time: 20:18

OMNI Equipment #'s: _____

Gas Analyzer Train Leak Check:

Stack: Dilution Tunnel (Method 5G Only):

Initial: _____ Initial: _____

Final: N/A Final: N/A

Calibrations: Span Gas CO_2: N/A O_2: N/A CO: N/A CO_2(DT): N/A

	N_2 Span	N_2 Span	N_2 Span	N_2 Span	N_2 Span	N_2 Span	N_2 Span
Time							
O_2			N/A				
CO_2							
CO							
CO_2 (DT)							

Stack Diameter (inches): 6.0

Air Velocity (ft/min): Initial: < 50 Final: < 50

Scale Audit (lbs.): Pretest: 10.0 Post Test: 10.0

Induced Draft: -0 %Smoke Capture: 100

Pitot Tube Leak Test: Pre: 0 @ 3.3" w.c. Post: 0 @ 3.1" w.c.

Flue Pipe Cleaned Prior to First Test in Series: Date: 2-23-07 Initials: JL

	Initial	Middle	Ending
Pb (in. Hg)	29.25	29.18	29.12
Room Temp (°F)	81	82	77

Technician signature: _____ Date: _____

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Run 5

OMNI-Test Laboratories, Inc.

Wood Heater Test Data - EPA Method 5G

Manufacturer: Harman Stove Company
Model: Large Woodstove
Project No.: 984
Tracking No.: 135-S-18-3
Run: 5
Test Date: 03/02/07

Burn Rate	1.08 kg/hr dry
Particulate Concentration (dry-standard) Particulate Emission Rate Adjusted Emissions	0.00005 grams/dscf 0.41 grams/hour 0.86 grams/hour
Average Tunnel Temperature	104 degrees Fahrenheit
Average Delta p	0.037 inches H20
Total Sample Volume - Vm Average Gas Meter Temperature Average Gas Velocity in Dilution Tunnel - vs Average Gas Flow Rate in Dilution Tunnel - Qsd Total Sample Volume (Standard Conditions) - Vms	208.57 cubic feet 84 degrees Fahrenheit 13.44 feet/second 8198.82 dscf/hour 191.43 dscf
Total Particulates - mn Average Delta H Total Time of Test	9.5 mg 0.85 inches H20 400 minutes

OMNI-Test Laboratories, Inc.

Wood Heater Test Data - EPA Method 5G

Run:	6
Manufacturer:	Harman Stove Company
Model:	Large Woodstove
Tracking No.:	984
Project No.:	135-S-18-3
Test Date:	02-Mar-07
Beginning Clock Time:	10:43
Recording Interval:	10 min.
Total Sampling Time:	300 min.

OMNI Equipment Numbers:

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	
Initial dP	0.039	0.040	0.036	0.033	0.035	0.040	0.039	0.039	"H2O
Initial Temp	115	115	114	114	114	113	113	113	oF

PM Control Module:	HAR-06	
Dilution Tunnel MW(dry):	29.00	lb/lb-mole
Dilution Tunnel MW(wet):	28.56	lb/lb-mole
Dilution Tunnel H2O:	4.00	percent
Dilution Tunnel Static:	-0.265	"H2O
Pitot Tube Cp:	0.99	
Meter Box Y Factor:	0.983	

Barometric Pressure:	Begin	Middle	End	Average
	28.91	28.92	28.88	28.90 "Hg

Signature/Date: 7-25-07

Tunnel Velocity:	14.28	ft/sec.
Intial Tunnel Flow:	137.4	scfm
Average Tunnel Flow:	145.0	scfm
Tunnel Area:	0.1963	ft2
Post-Test Leak Check:	.001 @ 8	cfm@"Hg
Fuel Moisture (dry basis	21.75	%
Total Particulate:	9.5	mg
Filter Holder No.:		

Elapsed Time	Particulate Sampling Data								Fuel Weight, lb		Wood Heater Temperature Data, oF											Stack	
	Gas Meter Cubic Feet	Sample Rate, cfm	Orifice dH	Meter oF	Meter Vac. In. Hg.	Dilution Tunnel Temp.	Dilution Tunnel dP	Pro. Rate (10%)	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Firebox Interior	Average Surface	Stack	Filter	Impinger exit	Ambient	Draft In. H2O	Catalyst Temp.
0	77.604		0.00	85	0	114	0.038		20.5		439	141	304	351	391		325.2	335	82	81	81	-0.045	
10	82.810	0.52	0.87	85	1	115	0.042	100	18.6	-1.9	356	143	344	346	372		312.2	407	83	53	81	-0.056	
20	87.950	0.51	0.87	85	1	114	0.041	100	17.3	-1.3	326	145	361	342	351		305.0	404	82	56	81	-0.056	
30	93.130	0.52	0.87	85	1	114	0.042	100	15.9	-1.4	323	144	387	336	336		305.2	423	82	56	81	-0.057	
40	98.310	0.52	0.87	85	1	117	0.042	100	14.5	-1.4	331	143	416	338	329		311.4	424	80	57	82	-0.057	
50	103.425	0.51	0.87	86	1	116	0.042	99	13.1	-1.4	339	142	406	349	327		312.6	420	80	56	81	-0.057	
60	108.730	0.53	0.87	86	1	114	0.041	103	11.8	-1.3	350	140	399	359	327		315.0	417	76	55	81	-0.056	
70	113.950	0.52	0.87	86	1	116	0.043	100	10.5	-1.3	366	140	409	372	328		323.0	429	78	55	82	-0.057	
80	119.160	0.52	0.87	87	1	117	0.042	100	9.2	-1.3	387	140	420	387	334		333.6	439	78	54	82	-0.057	
90	124.410	0.53	0.87	86	1	117	0.041	103	7.8	-1.4	411	140	434	403	342		346.0	442	78	54	83	-0.056	
100	129.480	0.51	0.87	86	1	118	0.041	99	6.6	-1.2	432	140	428	417	351		353.6	429	75	54	82	-0.056	
110	134.825	0.53	0.87	86	1	118	0.041	104	5.6	-1	438	141	404	428	358		353.8	406	72	55	82	-0.053	
120	140.160	0.53	0.87	87	1	115	0.041	104	5.0	-0.6	432	141	370	429	360		346.4	384	68	55	82	-0.050	
130	145.390	0.52	0.87	87	1	112	0.042	100	4.5	-0.5	427	141	328	421	358		335.0	360	72	55	82	-0.047	
140	150.685	0.53	0.87	87	1	110	0.041	103	4.1	-0.4	417	142	289	410	357		323.0	339	77	55	82	-0.045	
150	156.090	0.54	0.87	87	1	108	0.041	105	3.7	-0.4	411	142	271	402	353		315.8	333	81	55	81	-0.044	
160	161.290	0.52	0.87	87	1	108	0.042	99	3.3	-0.4	408	144	268	397	351		313.6	328	83	55	81	-0.043	
170	166.415	0.51	0.87	87	1	106	0.042	98	2.9	-0.4	405	145	263	391	350		310.8	326	84	55	82	-0.043	
180	171.630	0.52	0.87	86	1	106	0.041	101	2.6	-0.3	406	146	261	382	354		309.8	320	84	55	81	-0.042	
190	176.870	0.52	0.87	87	1	103	0.042	100	2.3	-0.3	404	147	243	376	354		304.8	301	84	55	80	-0.040	NA
200	182.110	0.52	0.87	86	1	103	0.042	100	2.0	-0.3	396	149	225	372	353		299.0	289	83	56	80	-0.038	NA
210	187.310	0.52	0.87	86	1	102	0.042	99	1.7	-0.3	389	149	215	367	350		294.0	281	83	55	80	-0.037	NA
220	192.540	0.52	0.87	86	1	100	0.041	101	1.5	-0.2	380	152	206	363	348		289.8	272	83	55	80	-0.036	NA
230	197.760	0.52	0.87	86	1	100	0.041	100	1.3	-0.2	374	153	199	359	345		286.0	265	83	56	81	-0.035	NA
240	202.980	0.52	0.87	85	1	98	0.042	99	1.1	-0.2	370	153	192	353	345		282.6	257	83	55	81	-0.034	NA
250	208.200	0.52	0.87	85	1	99	0.041	101	0.9	-0.2	363	154	187	346	345		279.0	252	82	56	80	-0.033	NA
260	213.420	0.52	0.87	85	1	97	0.042	99	0.7	-0.2	360	154	182	339	343		275.6	245	83	55	80	-0.032	NA
270	218.640	0.52	0.87	85	1	96	0.041	100	0.5	-0.2	364	154	176	334	344		274.4	237	82	55	79	-0.031	NA
280	223.865	0.52	0.87	85	1	96	0.041	100	0.3	-0.2	360	154	169	328	345		271.2	271	82	55	80	-0.030	NA
290	228.985	0.51	0.87	84	1	95	0.041	98	0.1	-0.2	355	152	165	320	345		267.4	228	81	55	80	-0.030	NA
300	234.321	0.53	0.87	84	1	94	0.041	102	0.0	-0.1	344	151	160	313	341		261.8	224	81	55	80	-0.029	NA
Avg/Total	156.717	0.52	0.84	85.81		107.67	0.041	100.60									63		80.16	55.94		-0.045	#DIV/0!

OMNI-Test Laboratories, Inc.

Wood Heater Test Data - EPA Method 5G

Run: 5

Manufacturer:	Harman Stove Company
Model:	Large Woodstove
Tracking No.:	984
Project No.:	135-S-18-3
Test Date:	02-Mar-07
Beginning Clock Time:	12:15
Recording Interval:	10 min.
Total Sampling Time:	400 min.

OMNI Equipment Numbers:

Velocity Traverse Data

	Pt 1	Pt 2	Pt 3	Pt 4	Pt 5	Pt 6	Pt 7	Pt 8	
Initial dP	0.034	0.038	0.037	0.034	0.035	0.038	0.035	0.032	"H2O
Initial Temp.	117	117	117	117	118	118	118	118	oF

PM Control Module:	HAR-06			
Dilution Tunnel MW(dry):	29.00	lb/lb-mole		
Dilution Tunnel MW(wet):	28.56	lb/lb-mole		
Dilution Tunnel H2O:	4.00	percent		
Dilution Tunnel Static:	-0.249	"H2O		
Pitot Tube Cp:	0.99			
Meter Box Y Factor:	0.983			
Barometric Pressure:	Begin	Middle	End	Average
	28.69	28.73	28.8	28.74 "Hg

Signature/Date: 7-23-07

Tunnel Velocity:	13.44	ft/sec.
Intial Tunnel Flow:	132.5	scfm
Average Tunnel Flow:	136.6	scfm
Tunnel Area:	0.1963	ft2
Post-Test Leak Check:	.001 @ 8	cfm@"Hg
Fuel Moisture (dry basis	21.22	%
Total Particulate:	9.5	mg
Filter Holder No.:		

Elapsed Time	Particulate Sampling Data								Fuel Weight, lb		Wood Heater Temperature Data, oF											Stack	
	Gas Meter Cubic Feet	Sample Rate, cfm	Orifice dH	Meter oF	Meter Vac. In. Hg.	Dilution Tunnel Temp.	Dilution Tunnel dP	Pro. Rate (10%)	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Firebox Interior	Average Surface	Stack	Filter	Impinger exit	Ambient	Draft In. H2O	Catalyst Temp.
0	868.503		0.00	86	0	118	0.035		19.3		414	139	318	356	361		317.6	324	83	85	82	-0.042	
10	873.700	0.52	0.87	86	1	117	0.037	101	17.8	-1.5	339	141	355	342	346		304.6	388	84	60	84	-0.052	
20	878.915	0.52	0.87	86	1	115	0.037	101	16.6	-1.2	312	141	373	335	330		298.2	388	85	64	82	-0.052	
30	884.095	0.52	0.87	87	1	116	0.038	99	15.3	-1.3	312	140	382	328	319		296.2	392	83	66	83	-0.052	
40	889.315	0.52	0.87	87	1	116	0.039	98	14.0	-1.3	327	139	399	325	313		300.6	395	82	66	84	-0.052	
50	894.470	0.52	0.87	87	1	115	0.038	98	12.9	-1.1	340	138	394	324	310		301.2	384	82	64	85	-0.050	
60	899.730	0.53	0.87	88	1	115	0.038	100	11.9	-1	347	137	377	327	310		299.6	375	81	62	84	-0.049	
70	905.180	0.54	0.87	88	1	115	0.038	104	10.8	-1.1	350	136	367	333	311		299.4	375	80	58	84	-0.049	
80	910.255	0.51	0.87	88	1	114	0.038	97	9.8	-1	360	136	362	344	314		303.2	376	80	57	84	-0.049	
90	915.500	0.52	0.87	88	1	114	0.038	100	8.8	-1	370	135	364	353	320		308.4	377	79	57	83	-0.049	
100	920.740	0.52	0.87	88	1	113	0.039	98	7.9	-0.9	375	135	360	362	328		312.0	373	79	57	83	-0.049	
110	926.010	0.53	0.87	88	1	110	0.038	100	7.1	-0.8	381	134	349	370	334		313.6	361	78	56	84	-0.046	
120	931.160	0.51	0.87	87	1	111	0.038	98	6.4	-0.7	380	134	330	377	336		311.4	351	73	56	81	-0.046	
130	936.285	0.51	0.87	86	1	111	0.037	99	5.8	-0.6	389	132	313	379	336		309.8	347	71	56	81	-0.045	
140	941.445	0.52	0.87	85	1	109	0.038	98	5.3	-0.5	393	131	304	380	337		309.0	332	69	56	80	-0.043	
150	946.665	0.52	0.87	85	1	107	0.037	101	4.9	-0.4	389	131	277	377	336		302.0	319	71	56	80	-0.041	
160	951.915	0.53	0.87	84	1	106	0.037	101	4.6	-0.3	385	130	256	370	335		295.2	305	73	56	81	-0.040	
170	957.165	0.53	0.87	83	1	106	0.037	102	4.2	-0.4	385	129	240	361	334		289.8	293	75	56	80	-0.038	
180	962.405	0.52	0.87	83	1	104	0.039	99	3.9	-0.3	372	130	237	355	332		285.2	298	76	55	80	-0.039	
190	967.670	0.53	0.87	83	1	101	0.037	101	3.5	-0.4	372	129	238	348	330		283.4	290	77	55	80	-0.038	NA
200	972.895	0.52	0.87	84	1	102	0.037	100	3.2	-0.3	372	130	228	344	329		280.6	284	78	55	82	-0.037	NA
210	978.140	0.52	0.87	85	1	103	0.037	101	2.9	-0.3	366	131	221	342	342		280.4	278	79	56	81	-0.036	NA
220	983.375	0.52	0.87	84	1	101	0.037	101	2.6	-0.3	363	131	216	340	326		275.2	277	79	55	80	-0.036	NA
230	988.620	0.52	0.87	84	1	100	0.036	102	2.4	-0.2	366	131	216	334	324		274.2	273	79	55	79	-0.035	NA
240	993.815	0.52	0.87	83	1	101	0.036	101	2.2	-0.2	369	131	208	327	325		272.0	262	79	55	79	-0.033	NA
250	999.110	0.53	0.87	83	1	100	0.037	102	2.0	-0.2	367	130	198	322	322		267.8	256	78	55	78	-0.032	NA
260	1004.365	0.53	0.87	83	1	100	0.036	102	1.8	-0.2	362	131	192	318	319		264.4	251	79	55	79	-0.032	NA
270	1009.600	0.52	0.87	83	1	99	0.036	102	1.6	-0.2	350	132	187	315	315		259.8	245	78	55	78	-0.031	NA
280	1014.850	0.53	0.87	83	1	97	0.036	102	1.4	-0.2	343	131	184	311	311		256.0	242	79	55	78	-0.031	NA
290	1020.150	0.53	0.87	83	1	97	0.036	103	1.2	-0.2	334	130	180	305	307		251.2	236	79	55	78	-0.030	NA
300	1025.290	0.51	0.87	82	1	96	0.035	101	1.1	-0.1	327	130	175	300	305		247.4	230	79	55	77	-0.029	NA
310	1030.430	0.51	0.87	82	1	97	0.035	102	0.9	-0.2	320	131	169	295	302		243.4	222	79	55	78	-0.028	NA
320	1035.590	0.52	0.87	82	1	95	0.035	102	0.8	-0.1	311	132	162	290	299		238.8	214	79	55	79	-0.027	NA
330	1040.675	0.51	0.87	82	1	94	0.035	100	0.6	-0.2	302	132	156	285	295		234.0	208	79	55	77	-0.026	NA
340	1045.793	0.51	0.87	82	1	93	0.036	99	0.5	-0.1	294	130	151	279	291		229.0	203	79	54	77	-0.025	NA
350	1050.911	0.51	0.87	82	1	93	0.035	101	0.4	-0.1	283	128	144	272	286		222.6	194	78	55	77	-0.024	NA
360	1056.255	0.53	0.87	82	1	91	0.035	105	0.3	-0.1	272	125	139	263	279		215.6	188	78	54	76	-0.023	NA
370	1061.450	0.52	0.87	82	1	92	0.035	102	0.2	-0.1	263	124	134	259	274		210.8	182	77	55	76	-0.022	NA
380	1066.655	0.52	0.87	81	1	91	0.035	102	0.1	-0.1	251	123	130	251	267		204.4	175	78	54	78	-0.020	NA

OMNI-Test Laboratories, Inc.

Wood Heater Test Data - EPA Method 5G

Run:	5
Manufacturer:	Harman Stove Company
Model:	Large Woodstove
Tracking No.:	984
Project No.:	135-S-18-3
Test Date:	02-Mar-07
Beginning Clock Time:	12:15
Recording Interval:	10 min.
Total Sampling Time:	400 min.

Velocity Traverse Data

	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	
Initial dP	0.034	0.038	0.037	0.034	0.035	0.038	0.035	0.032	"H2O
Initial Temp.	117	117	117	117	118	118	118	118	oF

OMNI Equipment Numbers:

PM Control Module:	HAR-06
Dilution Tunnel MW(dry):	29.00 lb/lb-mole
Dilution Tunnel MW(wet):	28.56 lb/lb-mole
Dilution Tunnel H2O:	4.00 percent
Dilution Tunnel Static:	-0.249 "H2O
Pitot Tube Cp:	0.99
Meter Box Y Factor:	0.983

Barometric Pressure:

Begin	Middle	End	Average
28.69	28.73	28.8	28.74 "Hg

Signature/Date: 7-23-07

Tunnel Velocity:	13.44	ft/sec.
Intial Tunnel Flow:	132.5	scfm
Average Tunnel Flow:	136.6	scfm
Tunnel Area:	0.1963	ft2
Post-Test Leak Check:	.001 @ 8	cfm@"Hg
Fuel Moisture (dry basis):	21.22	%
Total Particulate:	9.5	mg
Filter Holder No.:		

Elapsed Time	Particulate Sampling Data								Fuel Weight, lb		Wood Heater Temperature Data, oF											Stack	
	Gas Meter Cubic Feet	Sample Rate, cfm	Orifice dH	Meter oF	Meter Vac. In. Hg.	Dilution Tunnel Temp.	Dilution Tunnel dP	Pro. Rate (10%)	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Firebox Interior	Average Surface	Stack	Filter	Impinger exit	Ambient	Draft In. H2O	Catalyst Temp.
390	1071.850	0.52	0.87	82	1	89	0.035	102	0.1	0	241	122	127	246	260		199.2	169	78	54	79	-0.019	NA
400	1077.075	0.52	0.87	83	1	89	0.036	101	0.0	-0.1	232	121	124	240	253		194.0	163	78	54	79	-0.018	NA
Avg/Total	208.572	0.52	0.85	84.39		103.72	0.037	100.73									124		78.29	57.29		-0.037	#DIV/0!

OMNI-Test Laboratories, Inc.

Final Laboratory Report - Method 5G
Dilution Tunnel Particulate Calculations

Client Name: Harman Stove Company
Model: Large Wood Stove
Project No.: 135-S-18-3
Tracking No.: 984

Equipment Numbers:

Run #: 5
Date: 03/02/07

Sample Component	Reagent	Filter # or Volume, ml	Weights			
			Final, mg	Tare, mg	Blank, mg/ml	Particulate, mg
A. Front filter catch	Filter	5A	605.3	601.4		3.9
B. Rear filter catch	Filter	5B	604.7	604.9		-0.2
C. Rinse of probe and filter assembly	Acetone	100	109923.6	109917.4	0.0045	5.8

Total Particulate, mg :	9.5

Component	Equations:
A. Front filter catch	Final (mg) - Tare (mg) = Particulate, mg
B. Rear filter catch	Final (mg) - Tare (mg) = Particulate, mg
C. Rinse of probe and filter assembly	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg

Analyst: M. Morgan Date: 3-12-07

OMNI Test Laboratories
Beaverton, OR Phone (503) 643-3788

STOVE TEMPERATURE TEST DATA - METHOD 5G R & D

Client/Model: _Harman Stove Company / Large Wood Stove **Project #:** 135-S-18.3 **Tracking #:** 984

Date: 3-02-07 Test Crew: K. Morgan Run #: 5

OMNI Equipment ID #:

Preburn [X] Test [ ] Coal Bed: Data: 0 = Range: 3.9 - 4.8 Actual: Coal Bed: 4.4

Time	Fuel Weight	Delta Weight	Stack Draft	TEMPERATURES (oF)								% GASES		
				Ambient	Top	Bottom	Back	Left	Right	Flue	Catalyst	O2	CO2	CO
0	18.4		-.064	72	280	80	405	221	234	482				
10	17.5	0.9	-.053	75	281	87	376	252	254	365				
20	16.6	0.9	-.045	76	282	96	293	262	260	314				
30	15.2	1.4	-.055	76	279	105	298	262	259	385				
40	14.1	1.1	-.055	76	277	109	359	265	259	388				
50	12.6	1.5	-.058	78	296	113	416	273	264	423				
60	11.3	1.3	-.058	79	320	116	437	284	277	430				
70	10.0	1.3	-.057	79	348	118	444	297	294	428				
80	9.0	1.0	-.053	81	371	121	429	310	312	404				
90	7.6	1.4	-.058	81	391	123	403	320	326	461				
00	6.4	1.2	-.055	82	381	126	450	328	340	428				
10	5.6	0.8	-.052	83	390	129	451	338	350	411				
20	4.9	0.7	-.048	83	404	132	421	347	357	380				
30	4.5	0.4	-.045	84	422	136	362	355	361	353				
132 ~~40~~	4.4	0.1	-.042	82	414	139	318	356	361	324				
50														
60														
70														
80														
90														
AVG														

Technician signature: K. Morgan Date: 3-02-07

OMNI-Test Laboratories, Inc.
Beaverton, OR

FUEL DATA

Client: Harman Stove Company
Model: Large Wood Stove
Project #: 135-S-18-3 Tracking #: 984
Date: 3-02-07 Test Crew: K. Morgan Run #: 5
OMNI Equipment ID #:
FUEL LOAD PREPARED BY: K. Morgan
FUEL: DOUGLAS-FIR SPECIES, UNTREATED, AIR-DRIED, STANDARD GRADE OR BETTER, DIMENSIONAL LUMBER.

PRE-BURN FUEL

MOISTURE CONTENT (METER – – DRY BASIS)

CALIBRATION: Cal Value (1) = 12% Actual Reading 12.0
Cal Value (2) = 22% Actual Reading 22.0

Piece	Length	Readings			Type
1	8 ft	19.3	19.7	21.4	2x4
2	8 ft	24.5	22.8	21.9	2x4
3	8 ft	21.3	22.6	24.4	2x4

Length of cut pieces: 26 @ 8" inches Pre-Burn Fuel Average Moisture: 21.99 %

Time (clock): 08:45 Room Temperature (F): 70 Initials: K

TEST FUEL

FUEL TYPE AND AMOUNT: 2 × 4 5 4 × 4 2
CALCULATED LOAD WEIGHT: ACTUAL LOAD WEIGHT: 10.5 (2 × 4)
8.8 (4 × 4)
FUEL PIECE LENGTH: 17.25" 19.3 Total

MOISTURE CONTENT (METER – – DRY BASIS)

PIECE	READINGS			TYPE
1	22.6	20.5	21.9	4x4
2	23.8	21.9	23.8	4x4
3	20.9	20.2	21.3	2x4
4	21.9	20.5	22.8	2x4
5	20.2	19.7	19.7	2x4
6	21.3	19.1	20.3	2x4
7	19.0	22.1	22.1	2x4
8				
9				
10				

OVERALL TEST FUEL LOAD MOISTURE AVERAGE: 21.22 %

Time (clock): 08:30 Room Temperature (F): 70 Initials: K

Technician signature: K. J. Morgan Date: 3-02-07

OMNI-Test Laboratories, Inc.
Beaverton, OR

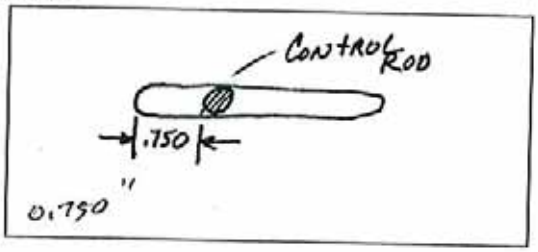
Run Notes

Client/Model: Harman Stove Company
Model: Large Wood Stove
Project #: 135-S-18-3
Tracking Number: 984
Run #: 5 Date: 3-02-07
Test Crew: K. Morgan
OMNI Equipment ID Numbers:

PREBURN

DESCRIBE OR SKETCH AIR OR THERMOMSTAT SETTINGS BELOW: (SETTINGS MUST BE ACCURATE AND REPRODUCABLE)

PRIMARY:



SECONDARY: Fixed

TERTIARY: None

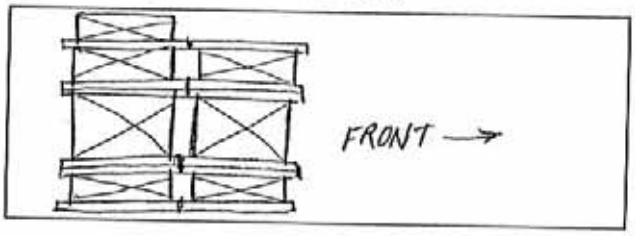
FAN: ON - High

PREBURN SETTINGS AND ACTIVITIES

TIME	AIR (THERMO) CHANGES PRIMARY/SECONDARY/TERTIARY	FAN SETTING CHANGE	ADD FUEL + WT.	ADD FUEL - WT.	RAKE COAL	COMMENT
0	test setting					
24					X	STIR
86					X	STIR
124					X	Levelled

TEST

TEST FUEL CONFIGURATION SKETCH
(INDICATE VIEW ANGLE)



START UP PROCEDURES

BYPASS: N/A
FUEL LOADING: Loaded by 60 sec.
DOOR: Closed at 68 sec.
PRIMARY AIR: Fully Open 5.0 min - Abruptly Closed to test Setting at 5.0 MIN.
OTHER: NONE

DESCRIBE OR SKETCH TEST SETTINGS BELOW: (SETTINGS MUST BE ACCURATE AND REPRODUCIBLE)
PRIMARY:

SAME AS ABOVE

SECONDARY: Fixed

TERTIARY: None

FAN: ON - High

Technician signature: K. Morgan Date: 3-02-07

OMNI-Test Laboratories, Inc.
Beaverton, OR

Supplemental Data EPA 5G/5H

Client: Harman Stove Company

Model: Large Wood Stove

Project No.: 135-S-18-3 Tracking No.: 984

Date: 3-02-07 Run No.: 5 Booth: _____

Test Crew: K. Morgan Start Time: 12:15 Stop Time: 18:55

OMNI Equipment #'s: _____

Gas Analyzer Train Leak Check:

Stack:

Initial: _____

Final: N/A

Dilution Tunnel (Method 5G Only):

Initial: _____

Final: N/A

Calibrations: Span Gas CO_2: N/A O_2: N/A CO: N/A CO_2(DT): N/A

	N_2 Span	N_2 Span	N_2 Span	N_2 Span	N_2 Span	N_2 Span	N_2 Span
Time							
O_2							
CO_2			N/A				
CO							
CO_2 (DT)							

Stack Diameter (inches): 6.0

Air Velocity (ft/min): Initial: < 50 Final: < 50

Scale Audit (lbs.): Pretest: 10.0 Post Test: 10.0

Induced Draft: ø %Smoke Capture: 100

Pitot Tube Leak Test: Pre: ø @ 3.1" w.c. Post: ø @ 3.1" w.c.

Flue Pipe Cleaned Prior to First Test in Series: Date: 2-23-07 Initials: JC

	Initial	Middle	Ending
Pb (in. Hg)	28.69	28.73	28.80
Room Temp (°F)	82	80	79

Technician signature: K. J. Morgan Date: 3-02-07

Run 6

OMNI-Test Laboratories, Inc.

Final Laboratory Report - Method 5G
Dilution Tunnel Particulate Calculations

Client Name: Harman Stove Company
Model: Large Wood Stove
Project No.: 135-S-18-3
Tracking No.: 984

Equipment Numbers:

Run #: 6
Date: 03/02/07

Sample Component	Reagent	Filter # or Volume, ml	Weights			
			Final, mg	Tare, mg	Blank, mg/ml	Particulate, mg
A. Front filter catch	Filter	6A	609.1	606.5		2.6
B. Rear filter catch	Filter	6B	600.0	600.5		-0.5
C. Rinse of probe and filter assembly	Acetone	125	109767.5	109759.5	0.0045	7.4

Total Particulate, mg :	9.5

Component	Equations:
A. Front filter catch	Final (mg) - Tare (mg) = Particulate, mg
B. Rear filter catch	Final (mg) - Tare (mg) = Particulate, mg
C. Rinse of probe and filter assembly	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg

Analyst: K. J. Morgan Date: 3-12-07

OMNI-Test Laboratories, Inc.

Wood Heater Test Data - EPA Method 5G

Manufacturer: Harman Stove Company
Model: Large Woodstove
Project No.: 984
Tracking No.: 135-S-18-3
Run: 6
Test Date: 03/02/07

Burn Rate	1.53 kg/hr dry
Particulate Concentration (dry-standard) Particulate Emission Rate Adjusted Emissions	0.00007 grams/dscf 0.57 grams/hour 1.15 grams/hour
Average Tunnel Temperature	108 degrees Fahrenheit
Average Delta p	0.041 inches H20
Total Sample Volume - Vm Average Gas Meter Temperature Average Gas Velocity in Dilution Tunnel - vs Average Gas Flow Rate in Dilution Tunnel - Qsd Total Sample Volume (Standard Conditions) - Vms	156.72 cubic feet 86 degrees Fahrenheit 14.28 feet/second 8697.62 dscf/hour 144.27 dscf
Total Particulates - mn Average Delta H Total Time of Test	9.5 mg 0.84 inches H20 300 minutes

OMNI Test Laboratories
Beaverton, OR Phone (503) 643-3788

STOVE TEMPERATURE TEST DATA - METHOD 5G R & D

Client/Model: _Harman Stove Company / Large Wood Stove **Project #:** 135-S-18.3 **Tracking #:** 984

Date: 3-02-07 Test Crew: K. Morgan Run #: 6

OMNI Equipment ID #:

Preburn [X]
Test [ ]

Coal Bed:
Data: 0 = Range: 4.1-5.1 Actual: Coal Bed: 4.4

Time	Fuel Weight	Delta Weight	Stack Draft	TEMPERATURES (oF) Ambient	Top	Bottom	Back	Left	Right	Flue	Catalyst	% GASES O2	CO2	CO
0	18.7		-.062	76	276	98	324	214	263	446				
10	16.8	1.9	-.063	76	282	101	332	222	287	434				
20	15.4	1.4	-.058	76	294	105	377	230	304	404				
30	14.2	1.2	-.057	77	303	110	378	238	317	403				
40	13.0	1.2	-.056	78	315	114	396	246	329	403				
50	11.9	1.1	-.056	78	333	118	394	253	342	401				
60	10.8	1.1	-.055	80	350	122	389	261	354	397				
70	8.8	2.0	-.062	80	364	126	421	274	365	458				
80	7.5	1.3	-.059	81	380	129	464	289	373	451				
90	6.5	1.0	-.056	81	405	131	447	307	391	421				
100	5.6	0.9	-.052	82	417	133	404	322	402	393				
110	5.1	0.5	-.050	82	424	135	364	330	401	373				
120	4.4	0.5	-.049	81	439	138	322	345	394	383				
30														
40														
50														
60														
70														
80														
90														
AVG														

Technician signature: K. Morgan Date: 3-02-07

OMNI-Test Laboratories, Inc.
Beaverton, OR

FUEL DATA

Client: Harman Stove Company
Model: Large Wood Stove
Project #: 135-S-18-3 Tracking #: 984
Date: 3-02-07 Test Crew: K. Morgan Run #: 6
OMNI Equipment ID #:
FUEL LOAD PREPARED BY: K. Morgan
FUEL: DOUGLAS-FIR SPECIES, UNTREATED, AIR-DRIED, STANDARD GRADE OR BETTER, DIMENSIONAL LUMBER.

PRE-BURN FUEL

MOISTURE CONTENT (METER -- DRY BASIS)

CALIBRATION: Cal Value (1) = 12% Actual Reading 12.0
Cal Value (2) = 22% Actual Reading 22.0

Piece	Length		Readings		Type
1	8 ft	18.7	20.9	21.6	2x4
2	8 ft	19.4	19.7	19.5	2x4
3	8 ft	19.1	20.1	20.5	2x4

Length of cut pieces: 2708 inches Pre-Burn Fuel Average Moisture: 19.94%

Time (clock): 20:10 Room Temperature (F): 70 Initials: K

TEST FUEL

FUEL TYPE AND AMOUNT: 2 × 4 2 4 × 4 5
CALCULATED LOAD WEIGHT: ACTUAL LOAD WEIGHT: 11.6 (2 × 4)
8.9 (4 × 4)
20.5 Total
FUEL PIECE LENGTH: 17.25"

MOISTURE CONTENT (METER -- DRY BASIS)

PIECE	READINGS			TYPE
1	24.2	20.3	22.0	4x4
2	24.9	20.5	24.3	4x4
3	22.0	18.8	21.7	2x4
4	23.8	22.1	19.5	2x4
5	23.2	21.0	21.1	2x4
6	22.0	18.9	21.4	2x4
7	22.7	19.7	22.7	2x4
8				
9				
10				

OVERALL TEST FUEL LOAD MOISTURE AVERAGE: 21.75%

Time (clock): 20:00 Room Temperature (F): 70 Initials: K

Technician signature: K. Morgan Date: 3-02-07

OMNI-Test Laboratories, Inc.
Beaverton, OR

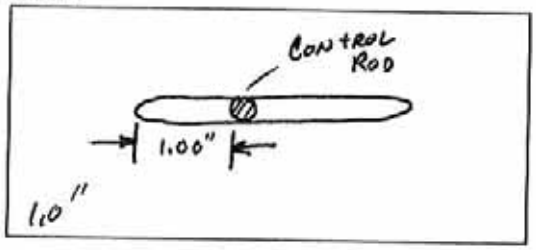
Run Notes

Client/Model: Harman Stove Company
Model: Large Wood Stove
Project #: 135-S-18-3
Tracking Number: 984
Run #: 6 Date: 3-02-07
Test Crew: K. Morgan
OMNI Equipment ID Numbers:

PREBURN

DESCRIBE OR SKETCH AIR OR THERMOMSTAT SETTINGS BELOW: (SETTINGS MUST BE ACCURATE AND REPRODUCABLE)

PRIMARY:



SECONDARY: FIXED

TERTIARY: NONE

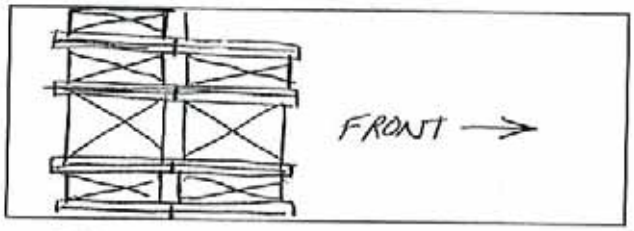
FAN: ON - High

PREBURN SETTINGS AND ACTIVITIES

TIME	AIR (THERMO) CHANGES PRIMARY/SECONDARY/TERTIARY	FAN SETTING CHANGE	ADD FUEL + WT.	ADD FUEL - WT.	RAKE COAL	COMMENT
0	TEST SETTING					
4					X	Adjust
60					X	Stir
117					X	Levelled

TEST

TEST FUEL CONFIGURATION SKETCH
(INDICATE VIEW ANGLE)



START UP PROCEDURES

BYPASS: N/A
FUEL LOADING: Loaded by 50 sec.
DOOR: Closed at 60 sec.
PRIMARY AIR: Fully Open for 5.0 min. Abruptly Closed to test setting AT 5.0 min.
OTHER: NONE

DESCRIBE OR SKETCH TEST SETTINGS BELOW: (SETTINGS MUST BE ACCURATE AND REPRODUCIBLE)

PRIMARY:

SAME AS ABOVE

SECONDARY: FIXED

TERTIARY: NONE

FAN: ON - High

Technician signature: K. Morgan Date: 3-2-07

OMNI-Test Laboratories, Inc.
Beaverton, OR

Supplemental Data EPA 5G/5H

Client: Harman Stove Company

Model: Large Wood Stove

Project No.: 135-S-18-3 Tracking No.: 984

Date: 3-2-07 Run No.: 6 Booth: 1

Test Crew: K. Morgan Start Time: ~~10:43~~ 22:43 Stop Time: 03:43 (3-03-07)

OMNI Equipment #'s:

Gas Analyzer Train Leak Check:

Stack: Initial: _____ Final: N/A

Dilution Tunnel (Method 5G Only): Initial: _____ Final: N/A

Calibrations: Span Gas CO_2: N/A O_2: N/A CO: N/A CO_2(DT): N/A

	N_2 Span	N_2 Span	N_2 Span	N_2 Span	N_2 Span	N_2 Span	N_2 Span
Time							
O_2							
CO_2			N/A				
CO							
CO_2 (DT)							

Stack Diameter (inches): 6.0

Air Velocity (ft/min): Initial: < 50 Final: < 50

Scale Audit (lbs.): Pretest: 10.0 Post Test: 10.0

Induced Draft: 0 %Smoke Capture: 100

Pitot Tube Leak Test: Pre: ø @ 3.2" W.C Post: ø @ 3.1" W.C.

Flue Pipe Cleaned Prior to First Test in Series: Date: 2-23-07 Initials: K

	Initial	Middle	Ending
Pb (in. Hg)	28.91	28.92	28.88
Room Temp (°F)	81	81	80

Technician signature: K. Morgan Date: 3-3-07

Section 5

Sampling Procedures and Test Results

INTRODUCTION

Harman Stove Company retained *OMNI* to perform U.S. Environmental Protection Agency (EPA) certification testing on the TL300 wood stove. The TL300 is a non-catalytic, freestanding, radiant-type room heater. The firebox is constructed of mild steel. The usable firebox volume was measured to be 3.0 cubic feet. The stove is vented through a 6-inch diameter flue collar located at the top of the unit.

The testing was performed at Harman's facility in Halifax, Penn. The unit was logged in on February 26, 2007, then assigned and labeled with *OMNI* ID #984. *OMNI* representative Ken Morgan conducted the certification testing and completed all testing by March 2, 2007. The EPA was notified of the testing dates in a letter dated February 22, 2007. A testing contract, including provisions for Random Compliance Audit (RCA) testing, has been signed by Dane Harman of Harman Stove Company and is on file at *OMNI*'s testing facility.

The TL300 was tested in accordance with the U.S. EPA 40 CFR Part 60, Subpart AAA – Standard of Performance for Residential Wood Heaters (Appendix A, Methods 28 and 5G). Particulate emissions were measured using a Method 5G sampling train consisting of two filters (front and back). The weighted average emissions of the four test runs included in the results indicate a particulate emission level of 1.1 grams per hour. Run #4, a fan confirmation test run, was performed and was not used in the weighted average emission results. If more than one test run us conducted in a burn rate category, the results from at least two-thirds of the test runs must be used in the weighted average emission results. Therefore, run #2 was not used in the weighted average emission results. Test runs were conducted in each of three burn rate categories (0.80-1.25 kg/hr, 1.25-1.90 kg/hr, and maximum). Emissions for each of their individual test runs did not exceed the cap. The TL300 results are within the emission limit of 7.5 grams per hour for non-catalytic affected facilities manufactured on or after July 1, 1990, or sold at retail on or after July 1, 1992.

The wood heater was sealed after completion of testing in compliance with the EPA regulation as follows:

- "DO NOT TAMPER" labels were placed on the door and on all other openings.
- Plastic material sealed with "DO NOT TAMPER" labels and tape was wrapped around the unit.
- The unit was sealed in a wood box constructed for the unit and secured with steel banding.
- "DO NOT TAMPER" labels were placed on all outer surfaces of the box.

This report is organized in accordance with the EPA-recommended outline and is summarized in the Table of Contents immediately preceding this report.

Table 1.1 – Particulate Emissions

Run	Burn Rate (kg/hr dry)	Method 5G Emissions (g/hr)
1	2.89	1.64
3	0.93	1.02
5	1.08	0.86
6	1.53	1.15
Weighted particulate emission average of four test runs: 1.1 grams per hour.		

Table 1.2 – Test Facility Conditions

Run	Room Temperature (°F)		Barometric Pressure (Hg)		Air Velocity (ft/min)	
	Before	After	Before	After	Before	After
1	83	84	29.03	29.07	<50	<50
3	79	75	29.37	29.40	<50	<50
5	82	79	28.69	28.80	<50	<50
6	81	80	28.91	28.88	<50	<50

Table 1.3.1 – Fuel Measurement and Crib Description Summary – PRETEST

Run	Pretest Fuel Weight (Starting weight in lbs)	Pretest Moisture (Dry basis - %)	Coal Bed Weight (lbs)
1	23.2	22.9	4.8
3	14.9	22.8	4.8
5	18.4	22.0	4.4
6	18.7	19.9	4.4

Table 1.3.2 – Fuel Measurement and Crib Description Summary – TEST

Run	Test Fuel Wet Basis (lbs)	Firebox Volume (ft^3)	Fuel Loading Density Wet Basis (lbs/ft^3)	Fuel Moisture Content Dry (%)	Piece Length (in)	2x4s Used	4x4s Used
1	19.6	3.0	6.53	23.0	17	5	2
3	21.1	3.0	7.03	21.3	17	5	2
5	19.3	3.0	6.43	21.2	17.25	5	2
6	20.5	3.0	6.83	21.8	17.25	2	5

Table 1.4 – 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	150	14.52	142.1	131.8
3	510	13.44	141.6	96.0
5	400	13.44	136.6	103.7
6	300	14.28	145.0	107.7

Table 1.5 - Heater Operation Data (Average Temperature Data)

Run	Beginning Surface Temperature Average[a]	Ending Surface Temperature Average[a]	Surface Delta T[b]
1	406.4	402.4	4
3	285.8	170.0	116
5	317.6	194.0	124
6	325.2	261.8	63

a. All temperatures are in degrees F.
b. Represents the difference between beginning and ending average surface temperatures.

Table 1.6 – Pretest Configuration

Run	Combustion Air (in)	Fuel Added	Fuel Removed	Time (min)
1	Fully Open	23.2 lbs at start; no addition; coal bed 4.8 lbs	0.0	82
3	Open 0.22"	14.9 lbs at start; no addition; coal bed 4.8 lbs	0.0	140
5	Open 0.75"	18.4 lbs at start; no addition; coal bed 4.4 lbs	0.0	132
6	Open 1.00"	18.7 lbs at start; no addition; coal bed 4.4 lbs	0.0	120

Table 1.7 – Run Data

Run	Average Dry Burn Rate (kg/hr)	Initial (Induced) Draft (H_2O)	Primary Air Setting (in)	Run Time (min)	Average Draft (H_2O)
1	2.89	0	Fully Open	150	-0.058
3	0.93	0	Open 0.221"	510	-0.030
5	1.08	0	Open 0.750"	400	-0.037
6	1.53	0	Open 1.000"	300	-0.045