Model: 3100 ACC
Hearth and Home Technologies
1445 North Highway
Colville, WA 99114

Certification Test Report

Hearth and Home Technologies

Freestanding Wood Stove
Model: 3100 ACC

Prepared for:	Hearth and Home Technologies 1445 North Highway Colville, WA 99114
Prepared by:	OMNI-Test Laboratories, Inc. 5465 SW Western Avenue, Suite G Beaverton, Oregon 97005 (503) 643-3788
Test Period:	May 22, 2006 through May 25, 2006
Report Date:	June 2006
Project Number:	061-S-66-3

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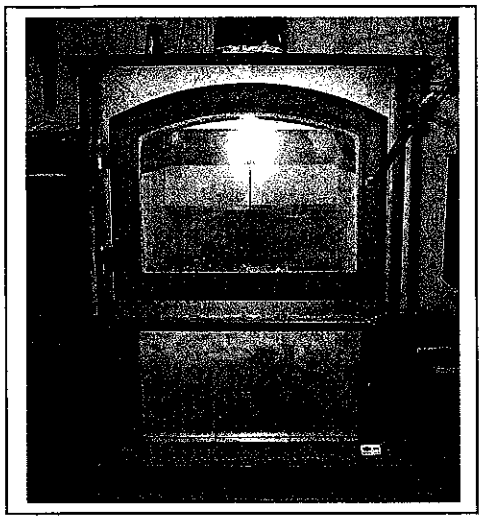

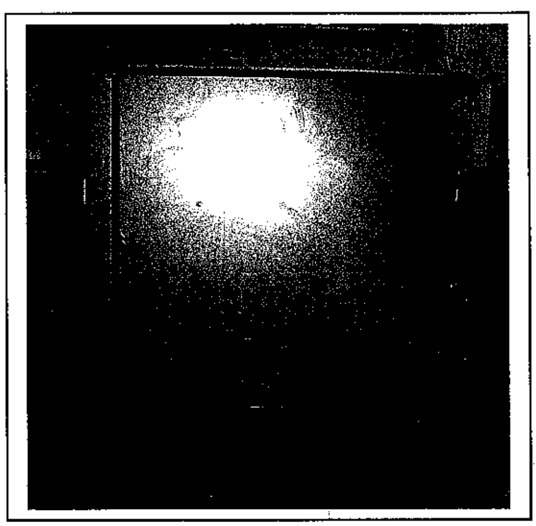

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Hearth and Home Technologies
1445 North Highway
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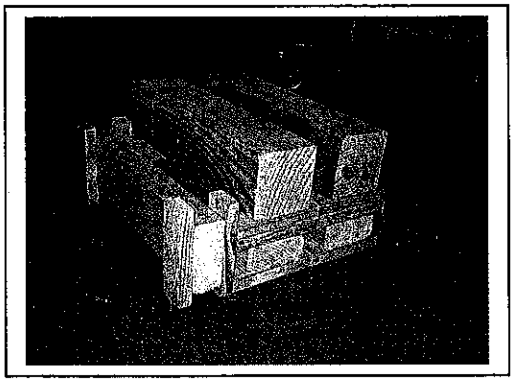
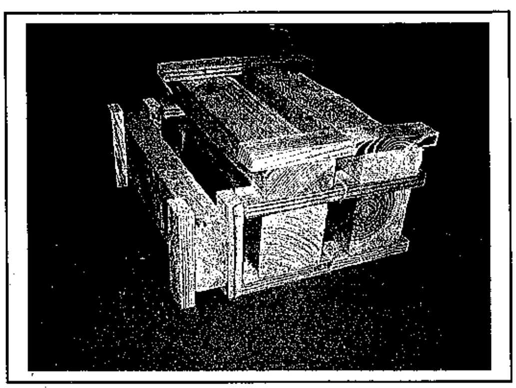
Model: 3100 ACC

Run 1 – Fuel

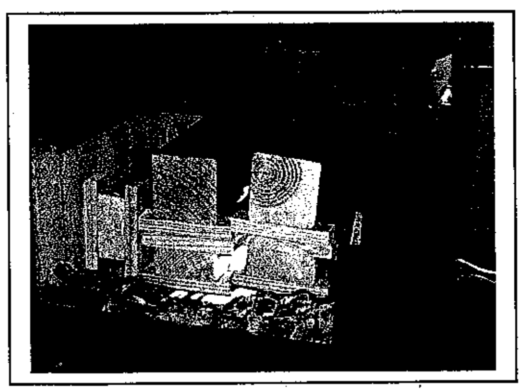


Run 1 - Newly Loaded Stove

Run 2 – Fuel



Run 2 - Newly Loaded Stove



Hearth and Home Technologies
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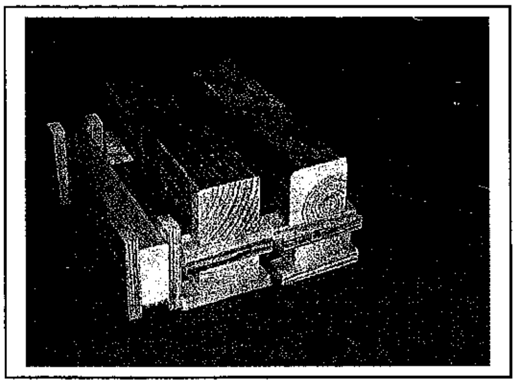
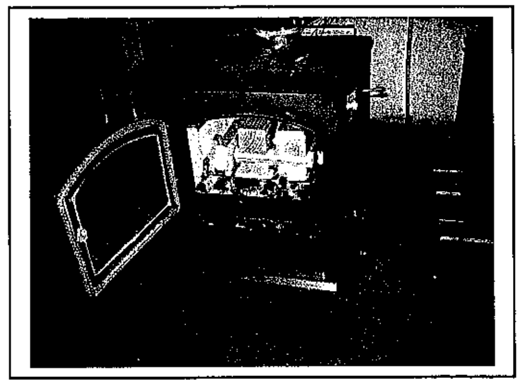
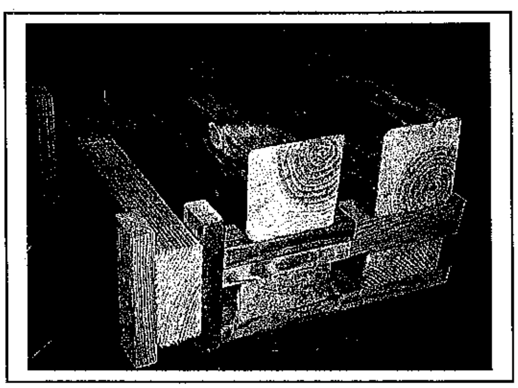
Run 3 – Fuel



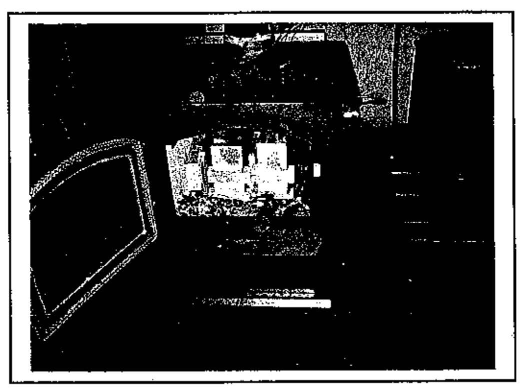
Run 3 - Newly Loaded Stove



Run 4 – Fuel



Run 4 - Newly Loaded Stove



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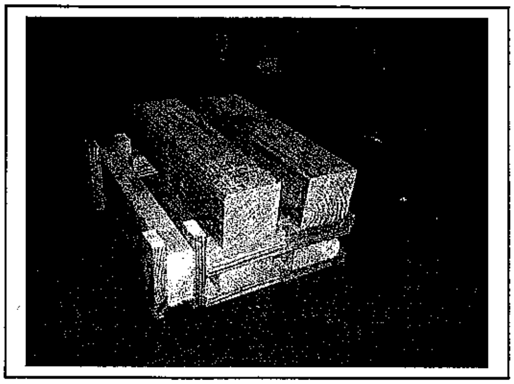
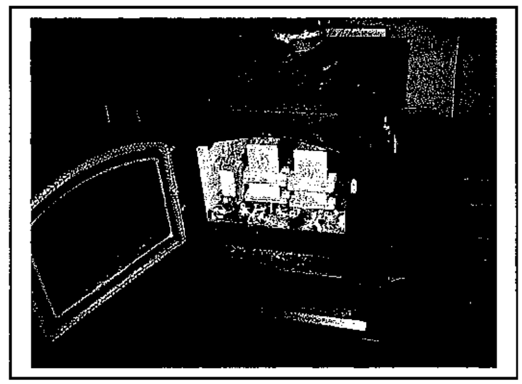
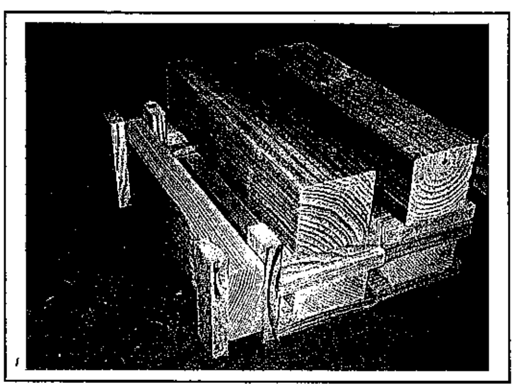
Run 5 – Fuel



Run 5 - Newly Loaded Stove



Run 6 – Fuel



Run 6 - Newly Loaded Stove

Section 4

Test Data by Run

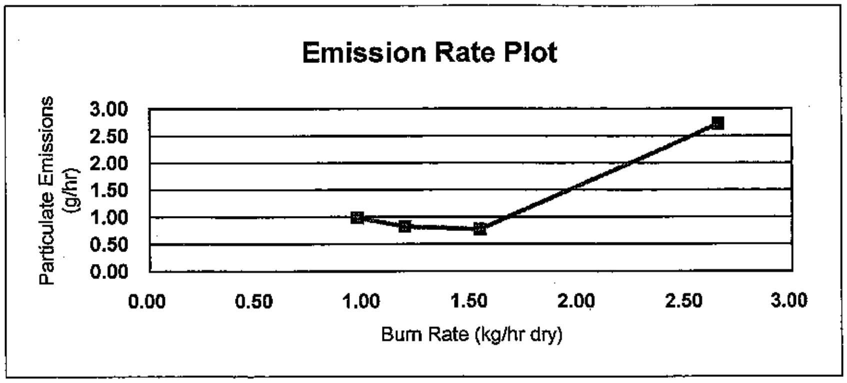
Model: 3100 ACC
Hearth and Home Technologies
1445 North Highway
Colville, WA 99114

Run 1

EPA Weighted Average Emissions
EPA Method 28

Client:	Hearth & Home Tecl	Status:	Final
Stove Model:	3100 ACC	Stove Type:	Non-Catalytic Stove
Test Dates:	May 22, 2006 Through May 25, 2006		
Project Number:	061-S-66-3		
Tracking Number:	862		
Signature/Date:	6-19-06		

Weighted Average (g/hr)
1.1



Run #	1	Low
Burn Rate (dry kg/hr)	0.97	
Catagory	2	
Overall Efficiency (%)	63%	
Emissions (g/hr)	0.98	
Cap (g/hr)	15	
Weighting Factor	0.538	33.08%
Heat Output (BTU/hr)	11721	

Run #	5	ML
Burn Rate (dry kg/hr)	1.19	
Catagory	2	
Overall Efficiency (%)	63%	
Emissions (g/hr)	0.82	
Cap (g/hr)	15	
Weighting Factor	0.424	26.10%
Heat Output (BTU/hr)	14379	

Run #	4	MH
Burn Rate (dry kg/hr)	1.54	
Catagory	3	
Overall Efficiency (%)	63%	
Emissions (g/hr)	0.77	
Cap (g/hr)	18	
Weighting Factor	0.437	26.87%
Heat Output (BTU/hr)	18609	

Run #	2	High
Burn Rate (dry kg/hr)	2.65	
Catagory	4	
Overall Efficiency (%)	63%	
Emissions (g/hr)	2.72	
Cap (g/hr)	18	
Weighting Factor	0.227	13.95%
Heat Output (BTU/hr)	32021	

Wood Heater Test Data
EPA Method 5H

Run Number 1

Manufacturer:	Hearth and Home Tech	Sample Rate Control Module Number:	322
Stove Model, Tracking Number:	3100 ACC/862	Test Meter 'Y':	0.995
Stove Type (cat, ncat, or pellet):	ncat	Orifice dH@:	1.892
Project Number:	061-S-66-3	Pitot Tube Cp:	0.99
Test Date:	22-May-06	Average Barometric Pressure:	28.01
Test Start Time:	10:14	Average Fuel Moisture (dry basis %):	20.78
Recording Interval (minutes):	10	OMNI Equipment Numbers:	
Total Sampling Time (minutes):	320		

Dilution Tunnel Velocity Traverse Data	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8		Dilution Tunnel Flow Initial
Initial dP	0.038	0.047	0.048	0.037	0.043	0.048	0.044	0.034	"H2O	147.1
Initial Temp	85	85	85	85	85	85	85	85	oF	scf/minute

Signature/Date: B R— 6-19-06

Post-Test Leak Check: .006@6" cfm@"Hg

Initial/Assumed Values				
Dilution Tunnel	MW (lb/lb-mol)	28.56	Ambient CO2 (%)	0.034
	H2O (%)	4.00	Preferred Initial Sampling Rate (cf/minute)	0.35

Flue Gas	
Impinger liquid, Vlc (g)	166.1
Volume of Water Vapor, Vw(std) (ft3)	7.83
Moisture Content, Bws	0.071

	Particulate Sampling System								Fuel Weight		Stove Flue-Gas Conditions						Stove Temperatures (oF)						Dilution Tunnel				Laboratory
Elapsed Time	Dry Gas Meter Reading (cf)	Sample Rate (cfm)	Orifice dH (inches wc)	Proportional Rate (%)	Dry Gas Meter Temperature (F)	Sample Train Vacuum (inches Hg)	Impinger Exit Temperature (F)	Hot Box Temperature (F)	Scale Reading (lbs)	Weight Change (lbs)	Draft Pressure (inches wc)	O2 (%)	CO2 (%)	CO (%)	Temperature (F)	Air to Fuel Ratio (lb/lb)	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Average Surface Temperature (F)	Temperature (F)	dP Velocity Pressure (inches wc)	Static Pressure (inches wc)	CO2 (%)	Ambient Temperature (F)
0	0.000		0.38		73	.0	78	230	13.8		-0.027	12.9	6.7	0.98	153	13.5	258	435	372	405	457	385	85	0.042	-0.50	0.380	70
10	3.430	0.343	0.75	100.0	73	0	63	230	13.1	-0.7	-0.048	10.3	10.0	0.50	276	10.3	290	410	313	360	388	352	89	0.043	-0.50	0.760	69
20	7.910	0.448	0.90	96.2	73	0	61	231	11.9	-1.2	-0.058	9.3	10.8	0.31	375	9.8	457	391	280	355	366	370	98	0.043	-0.50	0.900	69
30	13.169	0.526	0.69	102.1	74	1	57	230	10.7	-1.2	-0.060	7.6	12.3	0.26	396	8.8	537	372	266	377	361	383	102	0.043	-0.50	0.900	70
40	17.810	0.464	0.47	102.0	74	1	56	231	9.5	-1.2	-0.060	9.6	10.1	0.39	338	10.3	541	336	273	413	475	408	96	0.043	-0.50	0.820	69
50	21.590	0.378	0.52	100.2	75	1	59	230	8.5	-1.0	-0.055	8.4	11.8	0.24	338	9.1	505	346	275	427	376	386	95	0.043	-0.50	0.750	69
60	25.508	0.392	0.47	99.2	75	1	60	231	7.5	-1.0	-0.052	8.5	11.4	0.46	341	9.2	518	338	285	439	404	397	95	0.043	-0.50	0.690	69
70	29.280	0.377	0.45	100.6	75	1	62	230	6.5	-1.0	-0.050	7.8	12.3	0.54	330	8.6	501	333	296	451	453	407	95	0.043	-0.50	0.730	70
80	32.976	0.370	0.37	100.2	76	1	63	232	5.5	-1.0	-0.051	7.0	13.0	0.52	336	8.2	511	326	309	471	478	419	95	0.043	-0.50	0.700	70
90	36.300	0.332	0.38	99.4	76	1	66	230	4.6	-0.9	-0.050	7.8	12.0	0.42	327	8.8	525	323	325	488	507	434	94	0.043	-0.50	0.660	70
100	39.780	0.348	0.35	101.9	76	1	64	231	3.8	-0.8	-0.048	8.6	11.2	0.68	301	9.2	487	322	339	489	537	435	91	0.043	-0.50	0.590	70
110	43.078	0.330	0.36	101.1	76	1	62	230	3.3	-0.5	-0.048	10.0	9.3	0.81	278	10.6	549	323	352	470	561	451	89	0.043	-0.50	0.500	70
120	46.373	0.329	0.28	99.8	76	1	61	230	2.9	-0.4	-0.040	12.1	7.1	1.15	231	12.6	382	326	368	446	566	418	86	0.043	-0.50	0.350	70
130	49.335	0.296	0.26	100.6	76	1	63	230	2.7	-0.2	-0.032	13.0	6.3	1.26	203	13.6	317	330	374	431	536	398	83	0.043	-0.50	0.300	69
140	52.153	0.282	0.25	100.5	76	1	64	230	2.5	-0.2	-0.030	13.2	6.1	1.18	187	14.1	278	334	363	393	488	371	81	0.043	-0.50	0.290	69
150	55.040	0.289	0.26	103.1	76	1	67	230	2.4	-0.1	-0.030	13.0	6.3	1.36	181	13.5	257	338	352	373	454	355	80	0.043	-0.50	0.300	69
160	57.709	0.267	0.24	95.0	76	1	67	230	2.2	-0.2	-0.024	12.8	6.5	1.57	177	12.9	245	340	348	362	438	347	80	0.043	-0.50	0.300	68
170	60.490	0.278	0.28	102.0	77	1	64	230	2.1	-0.1	-0.026	12.6	6.3	1.70	175	12.9	237	340	346	355	457	347	80	0.043	-0.50	0.310	69
180	63.371	0.288	0.31	98.6	78	1	62	230	1.9	-0.2	-0.025	12.8	6.0	1.89	173	13.1	233	339	347	350	419	338	81	0.043	-0.50	0.310	70
190	66.506	0.314	0.34	102.0	78	1	63	230	1.7	-0.2	-0.022	12.8	5.9	2.06	172	13.0	231	338	349	346	413	335	81	0.043	-0.50	0.320	70
200	69.570	0.306	0.38	94.8	78	1	66	229	1.5	-0.2	-0.022	12.8	5.9	2.15	172	12.9	229	338	352	343	407	334	82	0.043	-0.50	0.330	71
210	72.805	0.324	0.38	97.0	80	1	60	230	1.3	-0.2	-0.021	12.8	6.1	1.46	169	13.6	225	336	356	338	399	331	82	0.043	-0.50	0.350	72
220	76.045	0.324	0.39	94.0	81	1	60	229	1.1	-0.2	-0.020	13.0	5.9	1.50	169	13.9	224	336	357	335	401	331	82	0.043	-0.50	0.340	72
230	79.634	0.359	0.41	103.6	82	1	61	230	1.0	-0.1	-0.020	13.2	5.7	1.68	168	13.9	222	336	354	331	402	329	83	0.043	-0.50	0.340	72
240	83.182	0.355	0.43	96.9	82	1	64	230	0.8	-0.2	-0.020	13.8	5.2	1.36	165	15.3	220	336	340	326	394	323	83	0.043	-0.50	0.320	72
250	86.945	0.376	0.44	102.2	82	1	65	229	0.7	-0.1	-0.020	14.2	4.8	1.60	160	15.6	215	337	322	317	383	315	83	0.043	-0.50	0.300	72
260	90.580	0.364	0.44	98.0	83	1	66	230	0.6	-0.1	-0.020	14.1	4.8	1.54	158	15.8	210	337	312	308	374	308	83	0.043	-0.50	0.300	73
270	94.258	0.368	0.44	99.1	83	1	67	230	0.5	-0.1	-0.020	14.3	4.8	1.47	156	15.9	206	335	302	209	364	283	83	0.043	-0.50	0.300	73
280	97.935	0.368	0.44	99.1	84	1	67	230	0.4	-0.1	-0.020	14.5	4.6	1.51	155	16.3	201	333	296	292	356	296	83	0.043	-0.50	0.290	73
290	101.685	0.373	0.43	99.9	84	1	67	230	0.3	-0.1	-0.020	14.6	4.3	1.80	153	16.3	198	330	291	287	351	291	83	0.043	-0.50	0.270	72
300	105.375	0.371	0.34	100.6	84	1	67	231	0.2	-0.1	-0.020	14.7	4.4	1.85	150	15.9	193	336	286	281	342	288	83	0.043	-0.50	0.250	73
310	108.853	0.348	0.36	105.3	85	1	68	230	0.1	-0.1	-0.019	14.7	4.5	1.91	151	15.6	189	322	283	276	336	281	83	0.043	-0.50	0.260	72
320	112.207	0.335	0.36	99.1	85	1	67	231	0.0	-0.1	-0.019	14.5	4.7	1.72	153	15.6	188	320	282	273	333	279	83	0.043	-0.50	0.270	73
Total Sampling Time (minutes)	Total Sample Volume (cf)	Average Sampling Rate (cfm)	Average Orifice dH (inches wc)	Average Proportional Rate (%)	Average Meter Temp (oF)	Maximum Sample Train Vacuum (inches Hg)	Average Impinger Exit Temperature (F)	Average Hot Box Interior Temp (oF)	Total Fuel Burned (lbs)	Average Sample Interval Weight Change	Average Flue Draft (inches wc)	Average Oxygen (% O2)	Average Carbon Dioxide (% CO2)	Average Carbon Monoxide (%CO)	Average Flue Temp (oF)	Average Air to Fuel Ratio (lb/lb)	Average Firebox TopTemp (oF)	Average Firebox Bottom Temp (oF)	Average Firebox Back Temp (oF)	Average Firebox Left Side Temp (oF)	Average Firebox Right Side Temp (oF)	Difference in (Beg./End) Stove Surface Temps (oF)	Average Dilution Tunnel Temp (oF)	Average Dilution Tunnel dP (inches wc)	Average Dilution Tunnel Static Pressure (inches wc)	Average Dilution Tunnel CO2 (%)	Average Laboratory Ambient Temp (oF)
320	112.207	0.351	0.41	99.88	78.2	1.00	63.85	230.15	13.80	-0.43	-0.03	11.86	7.49	1.21	223.24	12.68	320.58	341.58	323.18	367.18	423.52	106	86.42	0.04	-0.50	0.44	70.58

Wood Heater Calculation Data
EPA Method 5H

Run	1
Manufacturer:	Hearth and Home Tech
Model/Tracking No.:	3100 ACC/862
Test Date:	22-May-06
Project Number:	061-S-66-3

Burn Rate (dry kg/hour) = 0.97

Emission Rate (grams/hour) = 0.98

Note: When using the CO2 tracer-gas method,1/Qf (by tracer gas) = Si

Elapsed Time (minutes)	Dilution Tunnel Velocity (feet/second actual)	Fo (1.00 to 1.12)	Qf by carbon balance (scf/minute)	Qt-new (scf/minute)	Qf by tracer gas (scf/minute)	1/Qf by tracer gas (Si)	Volume Sampled (dscf)	Si * Volume Sampled	Proportional Sample Rate	dH new
0	14.4	1.11		147.1	7.6	0.131				
10	14.5	1.03	8.0	147.9	10.8	0.093	3.168	0.415	100.0	0.753
20	14.7	1.06	13.1	146.7	11.8	0.085	4.142	0.384	96.2	0.903
30	14.7	1.07	11.7	146.2	10.3	0.097	4.864	0.412	102.1	0.689
40	14.6	1.10	13.8	147.0	8.6	0.117	4.282	0.415	102.0	0.474
50	14.6	1.05	10.1	147.1	9.0	0.112	3.486	0.407	100.2	0.518
60	14.6	1.06	10.3	147.1	8.5	0.118	3.607	0.403	99.2	0.466
70	14.6	1.04	9.6	147.1	8.3	0.120	3.472	0.409	100.6	0.450
80	14.6	1.05	9.1	147.1	7.6	0.132	3.402	0.408	100.2	0.368
90	14.6	1.07	8.9	147.2	7.7	0.130	3.053	0.404	99.4	0.383
100	14.6	1.06	8.2	147.6	7.4	0.136	3.196	0.415	101.9	0.348
110	14.5	1.12	5.9	147.9	7.4	0.134	3.029	0.412	101.1	0.357
120	14.5	1.14	5.7	148.3	6.6	0.151	3.026	0.407	99.8	0.284
130	14.5	1.13	3.0	148.7	6.3	0.158	2.720	0.410	100.6	0.257
140	14.4	1.14	3.1	149.0	6.3	0.159	2.587	0.410	100.5	0.255
150	14.4	1.12	1.5	149.1	6.3	0.158	2.651	0.422	103.1	0.258
160	14.4	1.10	2.9	149.1	6.1	0.163	2.451	0.387	95.0	0.243
170	14.4	1.14	1.5	149.1	6.6	0.152	2.553	0.416	102.0	0.278
180	14.4	1.15	2.9	149.0	6.9	0.145	2.641	0.402	98.6	0.305
190	14.4	1.15	2.9	149.0	7.3	0.138	2.868	0.416	102.0	0.339
200	14.5	1.14	2.9	148.9	7.5	0.133	2.804	0.386	94.8	0.362
210	14.5	1.17	3.0	148.9	7.8	0.129	2.960	0.394	97.0	0.385
220	14.5	1.17	3.1	148.9	7.8	0.129	2.954	0.381	94.0	0.385
230	14.5	1.16	1.6	148.7	8.0	0.124	3.266	0.421	103.6	0.411
240	14.5	1.19	3.4	148.7	8.2	0.121	3.223	0.401	98.9	0.432
250	14.5	1.17	1.8	148.7	8.3	0.120	3.419	0.415	102.2	0.439
260	14.5	1.19	1.8	148.7	8.3	0.120	3.302	0.398	98.0	0.439
270	14.5	1.17	1.8	148.7	8.3	0.120	3.335	0.402	99.1	0.439
280	14.5	1.17	1.8	148.7	8.3	0.120	3.334	0.402	99.1	0.442
290	14.5	1.18	1.8	148.7	8.2	0.122	3.376	0.405	99.9	0.430
300	14.5	1.14	1.8	148.7	7.4	0.136	3.358	0.408	100.6	0.344
310	14.5	1.12	1.8	148.7	7.5	0.133	3.147	0.428	105.3	0.359
320	14.5	1.13	1.7	148.7	7.5	0.133	3.030	0.403	99.1	0.359
Averages/Totals	14.5	1.12	5.0	148.2	7.9	0.129	3.210		99.9	0.411

Woodstove Type	
Yhc>1=cat,2=ncat, 3=pellet	2
EPA's Hydrocarbon Constant (%)	1.32
Fuel Data	
Test Charge (as fired lbs)	13.8
Average Moisture (% dry basis)	20.78
Average Moisture (% wet basis)	17.20
Run Parameters	
DGM initial reading (cf)	0.000
DGM final reading (cf)	112.207
Pb (inches Hg)	28.01
Tm (avg oF)	78.24
dH (avg inches wc)	0.41
Vm (scf)	102.640
Qf by carbon balance (avg dscf/minute)	5.02
Analytical Data	
Probe/Front Wash (mg)	35.5
Front Filter (mg)	74.0
Impinger PM (mg)	194.3
Back Filter (mg)	30.8
Total Weight (mg)	334.6
Emission Results	
Cs (g/dscf)	0.0033
ER (g/hour)	**0.98**

Final Laboratory Report - Method 5H
Dilution Tunnel Particulate Calculations

Client Name:	Hearth & Home Technologies	Equipment Numbers:	Run No.: 1
Model:	3100 ACC		Date: 05/22/06
Project No.:	061-S-66-3		
Tracking No.:	862		

PARTICULATE COMPONENTS

Sample Component	Reagent	Filter # or Volume, ml	Weights			
			Final, mg	Tare, mg	Blank, mg/ml	Particulate, mg
A. Front filter catch	Filter	M976	694.4	620.4		74.0
B. Rear filter catch	Filter	D261	176.1	145.3		30.8
C. Rinse of probe and filter assembly (FRONT)	Acetone	50	95179.9	95141.5	0.0576	35.5
D. Rinse of Impinger Set	Distilled Water	330	174119.1	174027.6	0.0010	91.2
E. Rinse of Impinger Set	Dichloromethane	150	110260.6	110232.1	0.0000	28.5
F. Rinse of filter assembly and gas train (BACK)	Acetone	120	102867.9	102786.4	0.0576	74.6
			Total Particulate, mg :			334.6

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 (FRONT)	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg
D. Rinse of Impinger Set	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg
E. Rinse of Impinger Set	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg
F. Rinse of filter assembly and gas train (BACK)	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg

CONDENSED WATER

IMPINGERS	Weights: Final, g	Initial, g	Net, g
1	666.7	549.5	117.2
2	664.2	654.2	10.0
3	562.7	560.0	2.7
4	878.2	842.0	36.2
		TOTAL, g:	166.1

Analyst: [signature] Date: 6-12-06

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

STOVE TEMPERATURE TEST DATA - METHOD 5G

Client/Model: Health Home Tech. 3100 Acc Project #: 061-S-66-3 Tracking #: 862

Date: 5-22-06 Test Crew: B Davis Run #: 1

OMNI Equipment ID #:

Preburn [X]
Test [ ]

Coal Bed: Data: 0 = 0 Range: 2.8-3.4 Actual: Coal Bed: 3.2

Time	Fuel Weight	Delta Weight	Stack Draft	Ambient	Top	Bottom	Back	Left	Right	Flue	Catalyst
				TEMPERATURES (oF)							
0	6.3	—	-.057	73	614	481	605	670	720	385	NA
10	5.3	1.0	-.051	74	558	493	582	619	682	335	
20	4.7	0.6	-.050	72	500	488	532	571	635	302	
30	3.9	0.4	-.050	72	~~325~~ 517	~~513~~ 475	~~474~~ 486	~~427~~ 530	~~532~~ 596	325	
40	3.6	0.3	-.038	72	413	456	446	495	550	242	
50	3.4	0.2	-.032	71	337	451	425	465	526	234	
60	3.3	0.1	-.027	70	278	444	392	427	484	166	
65 ~~70~~	3.2	0.1	-.027	71	260	437	375	409	461	155	
80											
90											
00											
10											
20											
30											
40											
50											
60											
70											
80											
90											
AVG											

Technician signature: B D Date: 6-6-06

4-7 of 4-50

FUEL DATA

Client: Hearth & Home Technologies
Model: 3100 ACC
Project #: 061-S-66-3 Tracking #: 862
Date: 5-22-06 Test Crew: BR Run #: 1
OMNI Equipment ID #:
FUEL LOAD PREPARED BY: B Davis
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
Cal Value (2) = 22% Actual Reading 22

Piece	Length	Readings			Type
1	24" ~~ft~~	20.0	22.7	20.8	2x4
2	ft				
3	ft				

Length of cut pieces: 8" inches Pre-Burn Fuel Average Moisture: 21.2%

Time (clock): 0855 Room Temperature (F): 74 Initials: BR

TEST FUEL

FUEL TYPE AND AMOUNT: 2 × 4 3 4 × 4 2
CALCULATED LOAD WEIGHT: 13.3 ACTUAL LOAD WEIGHT: 6.3 (2 × 4)
7.5 (4 × 4)
13.8 Total

FUEL PIECE LENGTH: 14"

MOISTURE CONTENT (METER -- DRY BASIS)

PIECE	READINGS			TYPE
1	18.6	21.4	18.2	4x4
2	20.9	20.0	18.9	4x4
3	22.5	20.3	23.8	2x4
4	22.1	21.9	21.9	2x4
5	22.7	19.2	17.3	2x4
6				
7				
8				
9				
10				

OVERALL TEST FUEL LOAD MOISTURE AVERAGE: ~~19.64~~ 20.78 BS

Time (clock): 0855 Room Temperature (F): 74 Initials: BR

Technician signature: B Davis Date: 6-6-06

OMNI-Test Laboratories, Inc.
Beaverton, OR

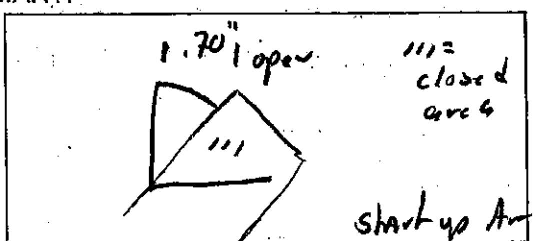
Run Notes

Client/Model: Hearth & Home Technologies
Model: 3100 ACC
Project #: 061-S-66-3
Tracking Number: 862
Run #: 1 Date: 5-25-06
Test Crew: B. Davis
OMNI Equipment ID Numbers:

PREBURN

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

PRIMARY:



Startup Air not used

SECONDARY: Fixed

TERTIARY: NA

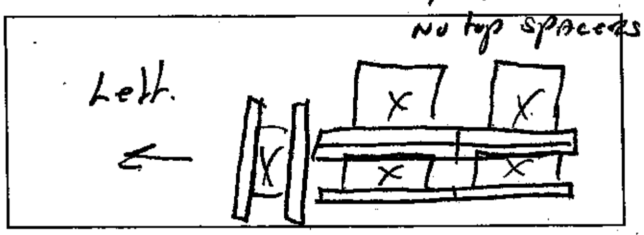
FAN: on high

PREBURN SETTINGS AND ACTIVITIES

TIME	AIR (THERMO) CHANGES PRIMARY/SECONDARY/TERTIARY	FAN SETTING CHANGE	ADD FUEL + WT.	ADD FUEL - WT.	RAKE COAL	COMMENT
Ø 50	Test setting				X	→

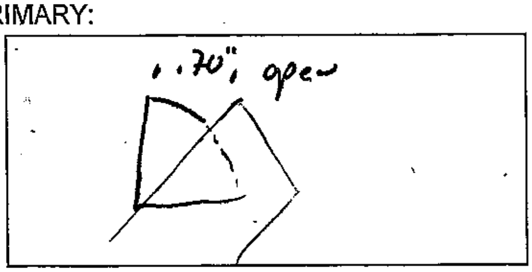
TEST

TEST FUEL CONFIGURATION SKETCH
(INDICATE VIEW ANGLE) Front view



START UP PROCEDURES
BYPASS: NA
FUEL LOADING: By 48 seconds
DOOR: closed by 65 seconds
PRIMARY AIR: At test setting full 5:00
OTHER: Timed Startup Air pushed @ 0 min.

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



SECONDARY: Fixed

TERTIARY: NA

FAN: on high

Technician signature: B. Davis Date: 5-25-06

OMNI-Test Laboratories, Inc.
Beaverton, OR

Supplemental Data EPA 5G/5H

Client: Hearth & Home Technologies

Model: 3100 ACC

Project No.: 061-S-66-3 Tracking No.: 862

Date: 5-22-06 Run No.: 1 Booth: 1

Test Crew: B. Davis Start Time: 10:14 Stop Time: 15:34

OMNI Equipment #'s: 148, 00006

Gas Analyzer Train Leak Check:

Stack:

Initial: good

Final: good

Dilution Tunnel (Method 5G Only):

Initial: good

Final: good

Calibrations: Span Gas CO_2: 9.9 O_2: 10.4 CO: 1.24 CO_2(DT): 1.24

Time	N_2 Span		N_2 Span		N_2 Span	N_2 Span	N_2 Span	N_2 Span	N_2 Span
	∅		Eot						
O_2	0.0	10.4	0.0	10.5					
CO_2	0.0	9.9	0.0	9.5					
CO	0.00	1.24	0.00	1.21					
CO_2 (DT)	0.00	1.24	0.00	1.24					

Stack Diameter (inches): 6"

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

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

Induced Draft: 0.0 %Smoke Capture: 100 %

Pitot Tube Leak Test: Pre: 0.0 @ 32" Post: 0.0 @ 30

Flue Pipe Cleaned Prior to First Test in Series: Date: 5-22-06 Initials: BD

	Initial	Middle	Ending
Pb (in. Hg)	28.10	27.99	27.95
Room Temp (°F)	70	7[illegible]	73

Technician signature: B D— Date: 6-6-06

Model: 3100 ACC
Hearth and Home Technologies
1445 North Highway
Colville, WA 99114

Run 2

Wood Heater Test Data
EPA Method 5H

Run Number 2

Manufacturer:	Hearth and Home Tech	Sample Rate Control Module Number:	322
Stove Model, Tracking Number:	3100 ACC/862	Test Meter 'y':	0.995
Stove Type (cat, ncat, or pellet):	ncat	Orifice dH@:	1.892
Project Number:	061-S-66-3	Pitot Tube Cp:	0.99
Test Date:	23-May-06	Average Barometric Pressure:	28.46
Test Start Time:	10:21	Average Fuel Moisture (dry basis %):	22.18
Recording Interval (minutes):	5	OMNI Equipment Numbers:	
Total Sampling Time (minutes):	110		

Dilution Tunnel Velocity Traverse Data										Dilution Tunnel Flow
	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8		Initial
Initial dP	0.043	0.048	0.046	0.035	0.037	0.045	0.048	0.036	"H2O	143.5
Initial Temp	120	120	120	120	120	120	120	120	oF	scf/minute

Signature/Date: B R 6-19-06

Post-Test Leak Check: .004@8" cfm@"Hg

Initial/Assumed Values				
Dilution Tunnel	MW (lb/lb-mol)	28.56	Ambient CO2 (%)	0.034
	H2O (%)	4.00	Preferred Initial Sampling Rate (cf/minute)	0.31

Flue Gas	
Impinger liquid, Vlc (g)	61.8
Volume of Water Vapor, Vw(std) (ft3)	2.91
Moisture Content, Bws	0.095

	Particulate Sampling System								Fuel Weight	
Elapsed Time	Dry Gas Meter Reading (cf)	Sample Rate (cfm)	Orifice dH (inches wc)	Proportional Rate (%)	Dry Gas Meter Temperature (F)	Sample Train Vacuum (inches Hg.)	Impinger Exit Temperature (F)	Hot Box Temperature (F)	Scale Reading (lbs)	Weight Change (lbs)
0	0.000		0.30		69	0	79	230	13.1	
5	1.500	0.300	0.51	100.0	69	1	60	230	12.1	-1.0
10	3.430	0.386	0.51	99.8	70	1	57	231	10.5	-1.6
15	5.270	0.368	0.49	96.4	70	1	56	230	9.0	-1.5
20	7.120	0.370	0.34	99.3	70	1	56	231	7.7	-1.3
25	8.679	0.312	0.34	100.1	70	1	57	230	6.2	-1.5
30	10.190	0.302	0.26	96.9	71	1	59	231	5.1	-1.1
35	11.554	0.273	0.22	100.1	71	1	61	230	4.0	-1.1
40	12.790	0.247	0.19	98.4	72	1	63	230	3.3	-0.7
45	13.970	0.236	0.21	100.8	72	1	64	230	2.7	-0.6
50	15.132	0.232	0.21	95.8	72	1	65	230	2.3	-0.4
55	16.366	0.247	0.21	101.5	73	1	61	230	1.9	-0.4
60	17.505	0.228	0.20	94.4	73	1	60	230	1.7	-0.2
65	18.690	0.237	0.21	99.4	73	1	61	230	1.4	-0.3
70	19.850	0.232	0.23	95.9	73	1	60	230	1.2	-0.2
75	21.050	0.240	0.22	95.0	73	1	60	230	1.0	-0.2
80	22.259	0.242	0.22	98.7	74	1	59	230	0.9	-0.1
85	23.570	0.262	0.21	106.6	74	1	60	230	0.7	-0.2
90	24.750	0.236	0.21	97.3	74	1	60	230	0.5	-0.2
95	26.000	0.250	0.20	103.0	74	1	62	230	0.3	-0.2
100	27.200	0.240	0.21	100.6	75	1	62	230	0.2	-0.1
105	28.450	0.250	0.21	101.7	75	1	64	230	0.1	-0.1
110	29.642	0.238	0.21	98.8	75	1	65	230	0.0	-0.1
Total Sampling Time (minutes)	Total Sample Volume (cf)	Average Sampling Rate (cfm)	Average Orifice dH (inches wc)	Average Proportional Rate (%)	Average Meter Temp (oF)	Maximum Sample Train Vacuum (inches Hg)	Average Impinger Exit Temperature (F)	Average Hot Box Interior Temp (oF)	Total Fuel Burned (lbs)	Average Sample Interval Weight Change
110	29.642	0.269	0.27	99.12	72.3	1.00	61.35	230.13	13.10	-0.60

	Stove Flue-Gas Conditions						Stove Temperatures (oF)						Dilution Tunnel				Laboratory
Elapsed Time	Draft Pressure (inches wc)	O2 (%)	CO2 (%)	CO (%)	Temperature (F)	Air to Fuel Ratio (lb/lb)	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Average Surface Temperature (F)	Temperature (F)	dP Velocity Pressure (inches wc)	Static Pressure (inches wc)	CO2 (%)	Ambient Temperature (F)
0	-0.051	12.6	7.7	0.13	362	13.3	403	519	565	602	657	549	120	0.042	-0.49	0.870	70
5	-0.078	5.4	14.1	0.39	548	7.7	474	513	517	566	611	536	139	0.042	-0.49	2.050	70
10	-0.080	2.9	16.6	1.15	685	6.3	661	504	476	554	605	560	161	0.042	-0.49	2.460	71
15	-0.081	2.5	16.6	0.72	716	6.5	779	491	459	577	632	588	173	0.042	-0.49	2.430	72
20	-0.081	3.2	16.3	0.46	707	6.7	831	481	460	605	668	609	174	0.042	-0.49	2.000	71
25	-0.081	3.0	16.1	0.46	694	6.8	854	471	466	637	704	626	174	0.042	-0.49	1.990	72
30	-0.080	4.1	15.2	0.16	671	7.3	856	466	479	662	726	638	170	0.042	-0.49	1.640	73
35	-0.078	5.1	14.7	0.12	636	7.5	830	463	498	682	744	643	163	0.042	-0.49	1.460	74
40	-0.073	6.7	12.9	0.08	601	8.5	803	462	517	698	760	648	156	0.042	-0.49	1.190	75
45	-0.068	10.2	9.6	0.09	527	11.0	717	464	539	704	766	638	144	0.042	-0.49	0.920	75
50	-0.068	11.0	8.9	0.12	492	11.8	642	467	552	691	761	623	136	0.042	-0.49	0.850	74
55	-0.066	11.9	8.1	0.18	459	12.7	581	472	561	669	741	605	130	0.042	-0.49	0.770	74
60	-0.062	12.2	7.9	0.20	442	12.9	538	476	564	644	721	589	125	0.042	-0.49	0.740	74
65	-0.060	12.9	6.9	0.28	426	14.3	511	479	567	627	705	578	122	0.042	-0.49	0.660	73
70	-0.060	13.3	6.6	0.37	405	14.7	479	483	569	611	685	565	119	0.042	-0.49	0.660	73
75	-0.054	13.3	6.6	0.49	396	14.4	456	486	564	592	667	553	117	0.042	-0.49	0.640	73
80	-0.053	13.8	6.3	0.53	381	14.9	434	488	556	578	650	541	114	0.042	-0.49	0.610	73
85	-0.052	13.8	6.4	0.60	371	14.6	412	490	546	532	632	522	111	0.042	-0.49	0.610	72
90	-0.053	13.8	6.3	0.63	367	14.7	394	491	532	547	619	517	110	0.042	-0.49	0.600	72
95	-0.052	13.9	6.3	0.55	361	14.9	379	491	516	531	603	504	109	0.042	-0.49	0.590	71
100	-0.051	14.5	5.7	0.57	357	16.0	376	491	509	524	595	499	108	0.042	-0.49	0.550	71
105	-0.051	14.6	5.7	0.67	348	15.8	365	490	503	517	584	492	106	0.042	-0.49	0.540	71
110	-0.050	14.7	5.4	0.70	342	16.4	357	487	495	510	575	485	106	0.042	-0.49	0.520	71
Total Sampling Time (minutes)	Average Flue Draft (inches wc)	Average Oxygen (% O2)	Average Carbon Dioxide (% CO2)	Average Carbon Monoxide (%CO)	Average Flue Temp (oF)	Average Air to Fuel Ratio (lb/lb)	Average Firebox TopTemp (oF0	Average Firebox Bottom Temp (oF)	Average Firebox Back Temp (oF)	Average Firebox Left Side Temp (oF)	Average Firebox Right Side Temp (oF)	Difference in (Beg./End) Stove Surface Temps (oF)	Average Dilution Tunnel Temp (oF)	Average Dilution Tunnel dP (inches wc)	Average Dilution Tunnel Static Pressure (inches wc)	Average Dilution Tunnel CO2 (%)	Average Laboratory Ambient Temp (oF)
110	-0.06	9.98	9.87	0.42	491.04	11.73	570.96	483.70	522.17	602.61	670.04	64	134.22	0.04	-0.49	1.10	72.39

Wood Heater Calculation Data
EPA Method 5H

Run	2

Manufacturer: Hearth and Home Tech

Model/Tracking No.: 3100 ACC/862

Test Date: 23-May-06

Project Number: 061-S-66-3

Burn Rate (dry kg/hour) =	2.65
Emission Rate (grams/hour) =	**2.72**

Note: When using the CO2 tracer-gas method,1/Qf (by tracer gas) = Si

Elapsed Time (minutes)	Dilution Tunnel Velocity (feet/second actual)	Fo (1.00 to 1.12)	Qf by carbon balance (scf/minute)	Qt-new (scf/minute)	Qf by tracer gas (scf/minute)	1/Qf by tracer gas (Si)	Volume Sampled (dscf)	Si * Volume Sampled	Proportional Sample Rate	dH new
0	14.7	1.07		143.5	15.7	0.064				
5	14.9	1.08	16.9	141.1	20.2	0.049	1.418	0.091	100.0	0.507
10	15.2	1.05	22.5	138.6	20.3	0.049	1.826	0.090	99.8	0.509
15	15.3	1.08	21.5	137.2	19.8	0.050	1.737	0.086	96.4	0.487
20	15.3	1.07	19.2	137.1	16.6	0.060	1.747	0.088	99.3	0.340
25	15.3	1.09	22.5	137.1	16.7	0.060	1.471	0.089	100.1	0.345
30	15.3	1.10	17.7	137.6	14.6	0.069	1.426	0.085	96.9	0.262
35	15.2	1.07	18.2	138.3	13.4	0.074	1.285	0.088	100.1	0.223
40	15.1	1.10	13.1	139.1	12.5	0.080	1.164	0.087	98.4	0.193
45	15.0	1.11	14.6	140.5	13.0	0.077	1.109	0.089	100.8	0.209
50	14.9	1.10	10.4	141.4	13.0	0.077	1.092	0.084	95.8	0.209
55	14.8	1.10	11.2	142.1	13.0	0.077	1.160	0.089	101.5	0.207
60	14.7	1.09	5.7	142.7	12.8	0.078	1.068	0.082	94.4	0.202
65	14.7	1.13	9.4	143.1	13.0	0.077	1.112	0.087	99.4	0.209
70	14.6	1.12	6.5	143.5	13.7	0.073	1.088	0.083	95.9	0.230
75	14.6	1.10	6.4	143.7	13.3	0.075	1.126	0.082	95.0	0.216
80	14.6	1.08	3.3	144.1	13.2	0.075	1.134	0.085	98.7	0.215
85	14.5	1.06	6.4	144.5	13.1	0.076	1.228	0.093	106.6	0.210
90	14.5	1.07	6.5	144.6	13.1	0.077	1.105	0.085	97.3	0.209
95	14.5	1.06	6.6	144.7	12.8	0.078	1.170	0.090	103.0	0.203
100	14.5	1.07	3.5	144.9	13.2	0.076	1.124	0.087	100.6	0.213
105	14.5	1.04	3.5	145.1	13.0	0.077	1.168	0.089	101.7	0.206
110	14.5	1.07	3.6	145.1	13.1	0.076	1.114	0.086	98.8	0.212
Averages/Totals	14.8	1.08	11.3	141.7	14.5	0.071	1.267		99.1	0.264

Woodstove Type	
Yhc>1=cat,2=ncat, 3=pellet	2
EPA's Hydrocarbon Constant (%)	1.32
Fuel Data	
Test Charge (as fired lbs)	13.1
Average Moisture (% dry basis)	22.18
Average Moisture (% wet basis)	18.15
Run Parameters	
DGM initial reading (cf)	0.000
DGM final reading (cf)	29.642
Pb (inches Hg)	28.46
Tm (avg oF)	72.26
dH (avg inches wc)	0.27
Vm (scf)	27.849
Qf by carbon balance (avg dscf/minute)	11.32
Analytical Data	
Probe/Front Wash (mg)	18.4
Front Filter (mg)	48.0
Impinger PM (mg)	38.8
Back Filter (mg)	6.3
Total Weight (mg)	111.5
Emission Results	
Cs (g/dscf)	0.0040
ER (g/hour)	**2.72**

Final Laboratory Report - Method 5H
Dilution Tunnel Particulate Calculations

Client Name:	Hearth & Home Technologies	Equipment Numbers:		Run No.:	2
Model:	3100 ACC			Date:	05/23/06
Project No.:	061-S-66-3				
Tracking No.:	862				

PARTICULATE COMPONENTS

Sample Component	Reagent	Filter # or Volume, ml	Weights			
			Final, mg	Tare, mg	Blank, mg/ml	Particulate, mg
A. Front filter catch	Filter	M977,M978	1290.3	1242.3		48.0
B. Rear filter catch	Filter	D262	151.9	145.6		6.3
C. Rinse of probe and filter assembly (FRONT)	Acetone	95	107418.9	107395.0	0.0576	18.4
D. Rinse of Impinger Set	Distilled Water	275	137768.1	137744.4	0.0010	23.4
E. Rinse of Impinger Set	Dichloromethane	150	105239.5	105237.2	0.0000	2.3
F. Rinse of filter assembly and gas train (BACK)	Acetone	100	108220.2	108201.4	0.0576	13.0
			Total Particulate, mg :			111.5

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 (FRONT)	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg
D. Rinse of Impinger Set	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg
E. Rinse of Impinger Set	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg
F. Rinse of filter assembly and gas train (BACK)	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg

CONDENSED WATER

IMPINGERS	Weights: Final, g	Initial, g	Net, g
1	596.6	546.3	50.3
2	659.8	657.5	2.3
3	561.4	561.1	0.3
4	883.9	875.0	8.9
		TOTAL, g:	61.8

Analyst: [signature] Date: 6-12-06

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

STOVE TEMPERATURE TEST DATA - METHOD 5G

Client/Model: Hearth & Home Tech 3100 ACC Project #: 061-S-66-3 Tracking #: 862

Date: 5-23-06 Test Crew: B Davis Run #: 2

OMNI Equipment ID #:

Preburn [X] / Test [ ]				Coal Bed Data:	0 = Ø		Range: 2.7-3.2		Actual: Coal Bed: 3.0		
				TEMPERATURES (oF)							
Time	Fuel Weight	Delta Weight	Stack Draft	Ambient	Top	Bottom	Back	Left	Right	Flue	Catalyst
0	14.5	/	-.060	67	399	452	589	563	608	282	
10	11.6	2.9	-.08	68	724	473	470	524	543	689	
20	8.0	3.6	-.082	71	797	469	472	573	577	679	
30	5.0	3.0	-.080	71	821	469	535	648	680	648	
40	3.7	1.3	-.068	73	678	485	603	696	757	487	
50	3.3	0.4	-.056	72	532	508	636	680	742	416	
60	3.0	0.3	-.052	70	424	521	588	622	680	367	
70											
80											
90											
00											
10											
20											
30											
40											
50											
60											
70											
80											
90											
AVG											

Technician signature: B Davis Date: 6-6-06

4-15 of 4-50

OMNI-Test Laboratories, Inc.
Beaverton, OR

FUEL DATA

Client: Hearth & Home Technologies
Model: 3100 ACC
Project #: 061-S-66-3 Tracking #: 862
Date: 5-23-06 Test Crew: B Davis Run #: 2
OMNI Equipment ID #:
FUEL LOAD PREPARED BY: B Davis
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
Cal Value (2) = 22% Actual Reading 22

Piece	Length	Readings			Type
1	10 ft	18.9	20.5	25.6	2x4
2	ft				
3	ft				

Length of cut pieces: 4e 14 inches Pre-Burn Fuel Average Moisture: 21.67%

Time (clock): 5e12 0825 Room Temperature (F): 65 Initials: BD

TEST FUEL

FUEL TYPE AND AMOUNT: 2 × 4 3 4 × 4 2
CALCULATED LOAD WEIGHT: 13.3 ACTUAL LOAD WEIGHT: (2 × 4)
6.5 (4 × 4)
13.1 Total

FUEL PIECE LENGTH: 14

MOISTURE CONTENT (METER – – DRY BASIS)

PIECE	READINGS			TYPE
1	25.0	27.5	27.4	4x4
2	21.7	22.7	22.4	4x4
3	20.2	20.0	18.9	2x4
4	22.4	22.1	22.0	2x4
5	22.5	21.7	22.2	2x4
6				
7				
8				
9				
10				

OVERALL TEST FUEL LOAD MOISTURE AVERAGE: 22.18

Time (clock): 0825 Room Temperature (F): 65 Initials: BD

Technician signature: B D Date: 6-6-06

OMNI-Test Laboratories, Inc.
Beaverton, OR

Run Notes

Client/Model: Hearth & Home Technologies
Model: 3100 ACC
Project #: 061-S-66-3
Tracking Number: 862
Run #: 2 Date: 5-23-06
Test Crew: B Davis
OMNI Equipment ID Numbers:

PREBURN

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

PRIMARY:

full open

Rear Air open
Timed Air full open

SECONDARY: fixed

TERTIARY: NA

FAN: on high

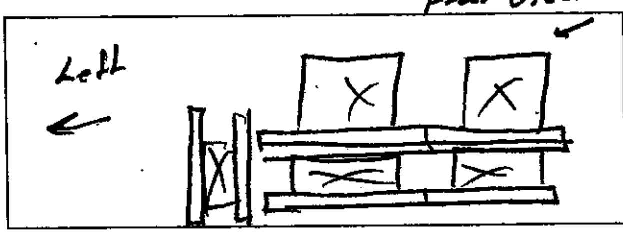
PREBURN SETTINGS AND ACTIVITIES

TIME	AIR (THERMO) CHANGES PRIMARY/SECONDARY/TERTIARY	FAN SETTING CHANGE	ADD FUEL + WT.	ADD FUEL - WT.	RAKE COAL	COMMENT
Ø 50	Test setting				x	→

TEST

TEST FUEL CONFIGURATION SKETCH
(INDICATE VIEW ANGLE) Front view

No Top Spacers



START UP PROCEDURES
BYPASS: NA
FUEL LOADING: By 50 sec
DOOR: closed by 70 sec.
PRIMARY AIR: at test setting full 5:00

OTHER: Timed air locked open
Rear Air open

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

PRIMARY:

Same as Above

SECONDARY: fixed

TERTIARY: NA

FAN: on high

Technician signature: B D Date: 6-6-06

OMNI-Test Laboratories, Inc.
Beaverton, OR

Supplemental Data EPA 5G/5H

Client: Hearth & Home Technologies

Model: 3100 ACC

Project No.: 061-S-66-3 Tracking No.: 862

Date: 5-23-06 Run No.: 2 Booth: 1

Test Crew: B Davis Start Time: 10:21 Stop Time: 12:11

OMNI Equipment #'s:

Gas Analyzer Train Leak Check:

Stack:

Initial: good

Final: good

Dilution Tunnel (Method 5G Only):

Initial: good

Final: good

Calibrations: Span Gas CO_2: 9.9 O_2: 10.4 CO: 1.24 CO_2(DT): 1.24

	N_2 Span		N_2 Span		N_2 Span	N_2 Span	N_2 Span	N_2 Span	N_2 Span
Time	Ø		EOT						
O_2	0.0	10.4	0.0	10.4					
CO_2	0.0	9.9	0.0	9.8					
CO	0.00	1.24	0.00	1.24					
CO_2 (DT)	0.00	1.24	0.00	1.25					

Stack Diameter (inches): 6"

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

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

Induced Draft: 0.0 %Smoke Capture: 100%

Pitot Tube Leak Test: Pre: 0.0 @ 3.0 Post: 0.0 @ 3.1

Flue Pipe Cleaned Prior to First Test in Series: Date: 5-22-06 Initials: BL

	Initial	Middle	Ending
Pb (in. Hg)	28.46	28.46	28.45
Room Temp (°F)	70	74	71

Technician signature: B Davis Date: 6-6-06

Model: 3100 ACC
Hearth and Home Technologies
1445 North Highway
Colville, WA 99114

Run 3

Wood Heater Test Data
EPA Method 5H

Run Number 3

Manufacturer:	Hearth and Home Tech	Sample Rate Control Module Number:	322
Stove Model, Tracking Number:	3100 ACC/862	Test Meter Y:	0.995
Stove Type (cat, ncat, or pellet):	ncat	Orifice dH@:	1.892
Project Number:	061-S-66-3	Pitot Tube Cp:	0.99
Test Date:	23-May-06	Average Barometric Pressure:	28.46
Test Start Time:	14:52	Average Fuel Moisture (dry basis %):	21.53
Recording Interval (minutes):	10	OMNI Equipment Numbers:	
Total Sampling Time (minutes):	200		

Dilution Tunnel Velocity Traverse Data										Dilution Tunnel Flow
	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8		Initial
Initial dP	0.038	0.041	0.045	0.030	0.041	0.044	0.042	0.030	"H2O	140.0
Initial Temp	100	100	100	100	100	100	100	100	oF	scf/minute

Signature/Date: [signature] 6-19-06

Post-Test Leak Check: .010@10" cfm@"Hg

Initial/Assumed Values				
Dilution Tunnel	MW (lb/lb-mol)	28.56	Ambient CO2 (%)	0.034
	H2O (%)	4.00	Preferred Initial Sampling Rate (cf/minute)	0.33

Flue Gas	
Impinger liquid, Vlc (g)	93.7
Volume of Water Vapor, Vw(std) (ft3)	4.42
Moisture Content, Bws	0.067

	Particulate Sampling System								Fuel Weight		Stove Flue-Gas Conditions						Stove Temperatures (oF)						Dilution Tunnel				Laboratory
Elapsed Time	Dry Gas Meter Reading (cf)	Sample Rate (cfm)	Orifice dH (inches wc)	Proportional Rate (%)	Dry Gas Meter Temperature (F)	Sample Train Vacuum (inches Hg.)	Impinger Exit Temperature (F)	Hot Box Temperature (F)	Scale Reading (lbs)	Weight Change (lbs)	Draft Pressure (inches wc)	O2 (%)	CO2 (%)	CO (%)	Temperature (F)	Air to Fuel Ratio (lb/lb)	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Average Surface Temperature (F)	Temperature (F)	dP Velocity Pressure (inches wc)	Static Pressure (inches wc)	CO2 (%)	Ambient Temperature (F)
0	0.000		0.34		77	0	78	230	13.2		-0.041	12.4	7.5	0.27	266	13.4	324	480	455	502	545	461	100	0.039	-0.46	0.680	73
10	3.157	0.316	0.66	100.0	77	1	58	230	11.4	-1.8	-0.058	6.8	13.3	0.13	528	8.2	539	486	394	456	502	471	129	0.039	-0.46	1.670	74
20	7.577	0.442	0.61	100.2	78	1	56	230	9.3	-2.1	-0.070	6.0	14.3	0.17	569	7.7	710	440	367	486	526	506	139	0.039	-0.46	1.740	74
30	11.920	0.434	0.54	101.4	78	1	60	230	7.3	-2.0	-0.071	5.2	14.6	0.26	570	7.5	741	421	370	532	557	524	140	0.039	-0.46	1.680	76
40	15.900	0.398	0.37	98.8	78	1	62	229	5.7	-1.6	-0.065	7.7	12.0	0.07	490	9.1	696	406	386	567	591	529	128	0.039	-0.46	1.140	77
50	19.316	0.342	0.39	102.1	79	1	65	230	4.5	-1.2	-0.057	8.8	11.3	0.09	445	9.6	580	396	397	573	607	511	119	0.039	-0.46	1.100	76
60	22.665	0.335	0.38	97.4	79	1	61	231	3.6	-0.9	-0.055	9.9	10.2	0.12	426	10.5	550	329	409	569	614	494	115	0.039	-0.46	0.970	76
70	26.060	0.340	0.37	100.9	79	1	60	231	2.9	-0.7	-0.054	11.1	8.7	0.13	397	12.0	510	384	426	547	606	495	111	0.039	-0.46	0.820	76
80	29.546	0.349	0.36	104.2	78	1	60	231	2.4	-0.5	-0.050	13.1	6.7	0.56	346	14.2	440	380	436	515	567	468	103	0.039	-0.46	0.630	75
90	32.760	0.321	0.33	97.3	78	1	62	231	2.1	-0.3	-0.050	13.6	6.4	0.63	324	14.5	393	378	429	492	537	446	101	0.039	-0.46	0.560	74
100	35.870	0.311	0.38	98.1	77	1	65	230	1.9	-0.2	-0.042	14.4	5.3	1.25	285	15.4	342	376	420	470	506	423	96	0.039	-0.46	0.510	74
110	39.235	0.337	0.32	100.5	77	1	66	230	1.7	-0.2	-0.042	13.9	5.9	1.11	279	14.5	312	373	406	447	479	403	94	0.039	-0.46	0.520	73
120	42.334	0.310	0.30	100.7	77	1	64	231	1.5	-0.2	-0.040	14.3	5.6	1.27	266	14.8	296	372	399	430	469	393	92	0.039	-0.46	0.480	73
130	45.406	0.307	0.33	102.8	77	1	60	230	1.3	-0.2	-0.040	14.7	5.1	1.14	261	16.0	285	370	392	416	453	383	90	0.039	-0.46	0.460	72
140	48.512	0.311	0.28	98.9	76	1	58	230	1.1	-0.2	-0.038	14.9	4.9	1.23	249	16.3	270	367	381	400	439	371	91	0.039	-0.46	0.410	72
150	51.472	0.296	0.32	102.7	76	1	59	230	0.9	-0.2	-0.032	15.0	4.7	1.30	242	16.5	261	365	375	390	428	364	93	0.039	-0.46	0.420	73
160	54.455	0.298	0.33	97.0	76	1	60	230	0.7	-0.2	-0.032	14.9	4.6	1.31	239	16.7	255	360	337	381	416	350	94	0.039	-0.46	0.420	74
170	57.528	0.307	0.32	98.0	78	1	62	230	0.5	-0.2	-0.031	15.4	4.2	1.28	232	17.8	247	354	358	372	407	348	93	0.039	-0.46	0.380	74
180	60.611	0.308	0.31	99.6	80	1	64	230	0.3	-0.2	-0.030	15.6	4.0	1.24	226	18.4	239	348	352	363	398	340	93	0.039	-0.46	0.360	75
190	63.657	0.305	0.28	99.1	81	1	64	230	0.1	-0.2	-0.030	15.9	3.7	1.27	219	19.2	230	343	345	351	391	332	93	0.039	-0.46	0.320	76
200	66.686	0.303	0.31	103.5	82	1	66	230	0.0	-0.1	-0.029	15.9	3.9	1.06	214	19.3	223	338	346	340	387	327	94	0.039	-0.46	0.350	77
Total Sampling Time (minutes)	Total Sample Volume (cf)	Average Sampling Rate (cfm)	Average Orifice dH (inches wc)	Average Proportional Rate (%)	Average Meter Temp (oF)	Maximum Sample Train Vacuum (inches Hg)	Average Impinger Exit Temperature (F)	Average Hot Box Interior Temp (oF)	Total Fuel Burned (lbs)	Average Sample Interval Weight Change	Average Flue Draft (inches wc)	Average Oxygen (% O2)	Average Carbon Dioxide (% CO2)	Average Carbon Monoxide (%CO)	Average Flue Temp (oF)	Average Air to Fuel Ratio (lb/lb)	Average Firebox TopTemp (oF0	Average Firebox Bottom Temp (oF)	Average Firebox Back Temp (oF)	Average Firebox Left Side Temp (oF)	Average Firebox Right Side Temp (oF)	Difference in (Beg./End) Stove Surface Temps (oF)	Average Dilution Tunnel Temp (oF)	Average Dilution Tunnel dP (inches wc)	Average Dilution Tunnel Static Pressure (inches wc)	Average Dilution Tunnel CO2 (%)	Average Laboratory Ambient Temp (oF)
200	66.686	0.333	0.37	100.16	78.0	1.00	62.38	230.19	13.20	-0.66	-0.05	12.36	7.47	0.76	336.81	13.89	402.05	383.14	389.52	457.10	496.43	134	105.14	0.04	-0.46	0.74	74.48

Wood Heater Calculation Data
EPA Method 5H

Run	3

Manufacturer: Hearth and Home Tech
Model/Tracking No.: 3100 ACC/862
Test Date: 23-May-06
Project Number: 061-S-66-3

Burn Rate (dry kg/hour) = 1.48

Emission Rate (grams/hour) = 0.46

Note: When using the CO2 tracer-gas method,1/Qf (by tracer gas) = Si

Elapsed Time (minutes)	Dilution Tunnel Velocity (feet/second actual)	Fo (1.00 to 1.12)	Qf by carbon balance (scf/minute)	Qt-new (scf/minute)	Qf by tracer gas (scf/minute)	1/Qf by tracer gas (Si)	Volume Sampled (dscf)	Si * Volume Sampled	Proportional Sample Rate	dH new
0	13.8	1.11		140.0	12.1	0.083				
10	14.2	1.05	16.4	137.1	16.9	0.059	2.940	0.243	100.0	0.660
20	14.4	1.04	17.9	135.9	16.3	0.062	4.120	0.244	100.2	0.609
30	14.4	1.07	16.6	135.8	15.3	0.065	4.040	0.249	101.4	0.543
40	14.2	1.10	16.1	137.2	12.7	0.079	3.702	0.241	98.8	0.371
50	14.1	1.07	12.7	138.3	13.1	0.076	3.176	0.250	102.1	0.394
60	14.1	1.07	10.4	138.8	12.8	0.078	3.108	0.238	97.4	0.376
70	14.0	1.12	9.3	139.2	12.6	0.079	3.151	0.247	100.9	0.367
80	13.9	1.11	7.8	140.2	12.5	0.080	3.235	0.256	104.2	0.362
90	13.9	1.08	5.0	140.5	12.0	0.083	2.988	0.238	97.3	0.335
100	13.8	1.09	3.2	141.1	12.8	0.078	2.891	0.240	98.1	0.376
110	13.8	1.08	3.2	141.4	11.7	0.085	3.134	0.246	100.5	0.317
120	13.8	1.05	3.3	141.6	11.3	0.088	2.886	0.246	100.7	0.297
130	13.8	1.08	3.6	141.9	11.9	0.084	2.861	0.252	102.8	0.329
140	13.8	1.08	3.6	141.7	11.0	0.091	2.893	0.242	98.9	0.278
150	13.8	1.09	3.7	141.5	11.7	0.085	2.762	0.252	102.7	0.317
160	13.8	1.13	3.7	141.4	12.0	0.084	2.783	0.238	97.0	0.330
170	13.8	1.12	4.0	141.5	11.8	0.085	2.867	0.240	98.0	0.318
180	13.8	1.13	4.1	141.5	11.6	0.086	2.866	0.244	99.6	0.311
190	13.8	1.13	4.3	141.5	11.0	0.091	2.821	0.243	99.1	0.279
200	13.8	1.11	2.1	141.4	11.6	0.087	2.800	0.254	103.5	0.305
Averages/Totals	13.9	1.09	7.6	140.0	12.6	0.080	3.101		100.2	0.374

Woodstove Type	
Yhc>1=cat,2=ncat, 3=pellet	2
EPA's Hydrocarbon Constant (%)	1.32
Fuel Data	
Test Charge (as fired lbs)	13.2
Average Moisture (% dry basis)	21.53
Average Moisture (% wet basis)	17.72
Run Parameters	
DGM initial reading (cf)	0.000
DGM final reading (cf)	66.686
Pb (inches Hg)	28.46
Tm (avg oF)	78.00
dH (avg inches wc)	0.37
Vm (scf)	62.001
Qf by carbon balance (avg dscf/minute)	7.55
Analytical Data	
Probe/Front Wash (mg)	8.3
Front Filter (mg)	28.5
Impinger PM (mg)	25.2
Back Filter (mg)	0.7
Total Weight (mg)	62.7
Emission Results	
Cs (g/dscf)	0.0010
ER (g/hour)	**0.46**

Final Laboratory Report - Method 5H
Dilution Tunnel Particulate Calculations

Client Name:	Hearth & Home Technologies	Equipment Numbers:		Run No.:	3
Model:	3100 ACC			Date:	05/23/06
Project No.:	061-S-66-3				
Tracking No.:	862				

PARTICULATE COMPONENTS

Sample Component	Reagent	Filter # or Volume, ml	Weights: Final, mg	Tare, mg	Blank, mg/ml	Particulate, mg
A. Front filter catch	Filter	M979	653.6	625.1		28.5
B. Rear filter catch	Filter	D263	145.8	145.1		0.7
C. Rinse of probe and filter assembly (FRONT)	Acetone	70	108599.5	108587.2	0.0576	8.3
D. Rinse of Impinger Set	Distilled Water	275	120743.8	120726.4	0.0010	17.1
E. Rinse of Impinger Set	Dichloromethane	150	111713.5	111712.0	0.0000	1.5
F. Rinse of filter assembly and gas train (BACK)	Acetone	100	102117.7	102105.3	0.0576	6.6
			Total Particulate, mg :			62.7

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 (FRONT)	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg
D. Rinse of Impinger Set	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg
E. Rinse of Impinger Set	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg
F. Rinse of filter assembly and gas train (BACK)	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg

CONDENSED WATER

IMPINGERS	Weights: Final, g	Initial, g	Net, g
1	617.6	543.7	73.9
2	660.0	654.6	5.4
3	561.3	560.0	1.3
4	897.0	883.9	13.1
		TOTAL, g:	93.7

Analyst: BC [signature] Date: 6-12-06

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

STOVE TEMPERATURE TEST DATA - METHOD 5G

Client/Model: Hearth & Home Tech Project #: 061-S-66-3 Tracking #: 861

Date: 5-23-06 Test Crew: BD Run #: 3

OMNI Equipment ID #:

Preburn [X] Test [ ]

Coal Bed: Data: 0 = Ø Range: 2.7-3.3 Actual: Coal Bed: 3.2

Time	Fuel Weight	Delta Weight	Stack Draft	Ambient	Top	Bottom	Back	Left	Right	Flue	Catalyst
				TEMPERATURES (oF)							
0	8.1	—	-.080	74	847	504	605	712	704	707	NA
10	6.3	1.8	-.057	75	758	509	585	698	715	493	
20	5.2	1.1	-.055	75	615	496	545	656	672	433	
30	4.6	0.6	-.053	74	561	485	521	631	631	407	
40	4.2	0.4	-.049	74	441	480	502	594	618	325	
50	3.3	0.9	-.046	73	384	481	489	562	594	299	
60	3.2	0.1	-.041	72	331	481	461	511	553	268	
70											
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90											
AVG											

Technician signature: BD Date: 6-6-06

4-23 of 4-50

OMNI-Test Laboratories, Inc.
Beaverton, OR

FUEL DATA

Client: Hearth & Home Technologies
Model: 3100 ACC
Project #: 061-S-66-3 Tracking #: 862
Date: 5-23-06 Test Crew: B Davis Run #: 3
OMNI Equipment ID #: ______
FUEL LOAD PREPARED BY: B Davis
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
Cal Value (2) = 22% Actual Reading 22

Piece	Length	Readings			Type
1	24" ~~ft~~	19.2	19.2	19.1	2x4
2	ft				
3	ft				

Length of cut pieces: 8" inches Pre-Burn Fuel Average Moisture:

Time (clock): 12:55 Room Temperature (F): 75 Initials: BR

TEST FUEL

FUEL TYPE AND AMOUNT: 2 × 4 3 4 × 4 2
CALCULATED LOAD WEIGHT: 13.3 ACTUAL LOAD WEIGHT: 6.4 (2 × 4)
6.8 (4 × 4)
13.2 Total
FUEL PIECE LENGTH: 14"

MOISTURE CONTENT (METER – – DRY BASIS)

PIECE	READINGS			TYPE
1	23.1	21.6	23.1	4x4
2	22.0	23.7	22.3	4x4
3	19.4	19.7	18.8	2x4
4	21.6	22.5	21.7	2x4
5	21.4	20.4	21.7	2x4
6				
7				
8				
9				
10				

OVERALL TEST FUEL LOAD MOISTURE AVERAGE: 21.53

Time (clock): 12:55 Room Temperature (F): 75 Initials: BR

Technician signature: B R Date: 6-6-06

OMNI-Test Laboratories, Inc.
Beaverton, OR

Run Notes

Client/Model: Hearth & Home Technologies
Model: 3100 ACC
Project #: 061-S-66-3
Tracking Number: 862
Run #: 3 Date: 5-23-06
Test Crew: B Davis
OMNI Equipment ID Numbers:

PREBURN

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

PRIMARY:

Primary Air full open
~~Timed Air open~~
BD ~~rear air closed~~
Timed Air Not used.

SECONDARY: Fixed

TERTIARY: NA

FAN: on High

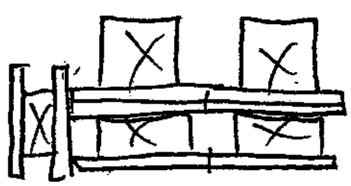
PREBURN SETTINGS AND ACTIVITIES

TIME	AIR (THERMO) CHANGES PRIMARY/SECONDARY/TERTIARY	FAN SETTING CHANGE	ADD FUEL + WT.	ADD FUEL - WT.	RAKE COAL	COMMENT
Ø	Test setting					
41	→	→	→	0.6	X	→
54	→	→	→	→	X	→

TEST

TEST FUEL CONFIGURATION SKETCH
(INDICATE VIEW ANGLE) Front

Left ←



START UP PROCEDURES
BYPASS: NA
FUEL LOADING by 50 Sec.
DOOR: Closed by 1:50
PRIMARY AIR: At test setting full 5:00

OTHER: Timed Air pushed @ zero minutes

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

Primary Air full open
Timed Air open
Rear air closed

SECONDARY: fixed

TERTIARY: NA

FAN: on High

Technician signature: BD Date: 6-6-06

Supplemental Data EPA 5G/5H

Client: Hearth & Home Technologies

Model: 3100 ACC

Project No.: 061-S-66-3 Tracking No.: 862

Date: 5-23-06 Run No.: 3 Booth: 1

Test Crew: B Davis Start Time: 14:52 Stop Time: 18:12

OMNI Equipment #'s:

Gas Analyzer Train Leak Check:

Stack:

Initial: good

Final: good

Dilution Tunnel (Method 5G Only):

Initial: good

Final: good

Calibrations: Span Gas CO_2: 9.9 O_2: 10.48 CO: 1.25 CO_2(DT): 1.24

Time	N_2 Span		N_2 Span		N_2 Span	N_2 Span	N_2 Span	N_2 Span	N_2 Span
	Ø		EOT						
O_2	0.0	10.4	0.0	10.4					
CO_2	0.0	9.9	0.0	9.7					
CO	0.00	1.24	0.00	1.25					
CO_2 (DT)	0.00	1.24	0.00	1.24					

Stack Diameter (inches): 6"

Air Velocity (ft/min): Initial: 250 ft/min Final: 250 ft/min

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

Induced Draft: 0.0 %Smoke Capture: 100%

Pitot Tube Leak Test: Pre: 0.0 @ 3.2 Post: 0.0 @ 3.0

Flue Pipe Cleaned Prior to First Test in Series: Date: 5-22-06 Initials: BD

	Initial	Middle	Ending
Pb (in. Hg)	28.46	28.46	28.46
Room Temp (°F)	73	74	77

Technician signature: B D Date: 6-6-06

Model: 3100 ACC
Hearth and Home Technologies
1445 North Highway
Colville, WA 99114

Run 4

Wood Heater Test Data
EPA Method 5H

Run Number 4

Manufacturer:	Hearth and Home Tech	Sample Rate Control Module Number:	322
Stove Model, Tracking Number:	3100 ACC/862	Test Meter 'y':	0.995
Stove Type (cat, ncat, or pellet):	ncat	Orifice dH@:	1.892
Project Number:	061-S-66-3	Pitot Tube Cp:	0.99
Test Date:	24-May-06	Average Barometric Pressure:	28.46
Test Start Time:	09:50	Average Fuel Moisture (dry basis %):	22.35
Recording Interval (minutes):	10	OMNI Equipment Numbers:	
Total Sampling Time (minutes):	180		

Dilution Tunnel Velocity Traverse Data										Dilution Tunnel Flow
	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8		Initial
Initial dP	0.043	0.045	0.041	0.028	0.038	0.043	0.044	0.035	"H2O	142.1
Initial Temp	94	94	94	94	94	94	94	94	oF	scf/minute

Signature/Date: BQ 6-19-06

Post-Test Leak Check: .006@8" cfm@"Hg

Initial/Assumed Values				
Dilution Tunnel	MW (lb/lb-mol)	28.56	Ambient CO2 (%)	0.034
	H2O (%)	4.00	Preferred Initial Sampling Rate (cf/minute)	0.32

Flue Gas	
Impinger liquid, Vlc (g)	96.3
Volume of Water Vapor, Vw(std) (ft3)	4.54
Moisture Content, Bws	0.070

	Particulate Sampling System								Fuel Weight		Stove Flue-Gas Conditions					
Elapsed Time	Dry Gas Meter Reading (cf)	Sample Rate (cfm)	Orifice dH (inches wc)	Proportional Rate (%)	Dry Gas Meter Temperature (F)	Sample Train Vacuum (inches Hg.)	Impinger Exit Temperature (F)	Hot Box Temperature (F)	Scale Reading (lbs)	Weight Change (lbs)	Draft Pressure (inches wc)	O2 (%)	CO2 (%)	CO (%)	Temperature (F)	Air to Fuel Ratio (lb/lb)
0	0.000		0.32		70	0	77	230	12.5		-0.041	11.7	8.0	0.34	258	12.6
10	2.980	0.298	0.83	100.0	70	5	57	230	10.9	-1.6	-0.071	7.3	13.3	0.23	527	8.2
20	7.950	0.497	0.74	102.1	71	5	62	231	8.8	-2.1	-0.073	6.5	13.8	0.34	559	7.9
30	12.753	0.480	0.59	102.8	72	5	68	230	6.7	-2.1	-0.070	5.7	14.3	0.37	540	7.6
40	16.870	0.412	0.51	98.4	72	5	64	230	5.2	-1.5	-0.070	7.2	12.4	0.12	488	8.8
50	20.780	0.391	0.40	101.0	73	5	63	230	3.8	-1.4	-0.062	7.7	12.2	0.18	462	8.9
60	24.285	0.351	0.41	101.3	74	5	64	230	2.8	-1.0	-0.062	8.7	10.7	0.19	229	10.0
70	27.730	0.345	0.41	98.1	74	5	66	230	2.2	-0.6	-0.052	11.0	8.2	0.33	230	12.3
80	31.178	0.345	0.41	98.5	75	5	67	230	1.9	-0.3	-0.050	12.8	6.5	0.68	230	14.3
90	34.664	0.349	0.39	98.9	75	5	64	230	1.7	-0.2	-0.042	13.8	5.7	1.09	286	14.9
100	38.140	0.348	0.39	101.7	76	5	64	230	1.4	-0.3	-0.042	13.7	5.9	1.02	273	14.7
110	41.468	0.333	0.37	96.8	76	5	64	229	1.2	-0.2	-0.040	14.0	5.6	0.99	259	15.3
120	44.690	0.322	0.36	96.6	76	5	65	230	1.0	-0.2	-0.039	14.1	5.5	1.04	252	15.4
130	48.000	0.331	0.38	101.5	77	5	67	229	0.8	-0.2	-0.037	14.5	5.2	1.00	246	16.1
140	51.209	0.321	0.35	95.3	77	5	66	230	0.6	-0.2	-0.037	14.5	5.3	1.04	241	15.8
150	54.512	0.330	0.36	102.1	77	5	67	230	0.4	-0.2	-0.037	14.7	5.0	0.98	238	16.6
160	57.727	0.322	0.37	98.4	78	5	68	230	0.2	-0.2	-0.034	14.9	4.9	1.01	234	16.8
170	61.065	0.334	0.37	99.9	78	5	67	230	0.1	-0.1	-0.037	15.0	4.9	0.99	231	16.8
180	64.386	0.332	0.35	99.4	78	5	66	230	0.0	-0.1	-35.000	15.3	4.7	0.95	230	17.4

	Stove Temperatures (oF)						Dilution Tunnel				Laboratory
Elapsed Time	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Average Surface Temperature (F)	Temperature (F)	dP Velocity Pressure (inches wc)	Static Pressure (inches wc)	CO2 (%)	Ambient Temperature (F)
0	313	470	439	478	535	447	94	0.039	-0.50	0.650	70
10	528	451	376	436	470	452	124	0.039	-0.50	1.730	70
20	685	426	352	461	484	482	134	0.039	-0.50	1.710	71
30	708	404	356	515	524	501	131	0.039	-0.50	1.590	72
40	683	390	371	555	561	512	123	0.039	-0.50	1.270	73
50	610	381	394	575	602	512	117	0.039	-0.50	1.110	73
60	431	582	374	574	622	517	113	0.039	-0.50	0.990	73
70	374	510	371	455	568	456	106	0.039	-0.50	0.760	72
80	326	429	371	366	547	408	101	0.039	-0.50	0.610	72
90	358	373	454	507	552	449	95	0.039	-0.50	0.520	71
100	318	375	444	472	514	425	93	0.039	-0.50	0.540	71
110	297	374	436	450	489	409	90	0.039	-0.50	0.500	71
120	284	372	424	435	469	397	88	0.039	-0.50	0.480	71
130	273	369	406	419	452	384	88	0.039	-0.50	0.470	71
140	264	365	394	407	442	374	87	0.039	-0.50	0.460	70
150	258	361	384	397	437	367	87	0.039	-0.50	0.440	70
160	252	357	377	390	431	361	87	0.039	-0.50	0.440	70
170	258	334	372	384	424	354	86	0.039	-0.50	0.440	71
180	242	350	369	379	417	351	86	0.039	-0.50	0.410	70

Total Sampling Time (minutes)	Total Sample Volume (cf)	Average Sampling Rate (cfm)	Average Orifice dH (inches wc)	Average Proportional Rate (%)	Average Meter Temp (oF)	Maximum Sample Train Vacuum (inches Hg)	Average Impinger Exit Temperature (F)	Average Hot Box Interior Temp (oF)	Total Fuel Burned (lbs)	Average Sample Interval Weight Change	Average Flue Draft (inches wc)	Average Oxygen (% O2)	Average Carbon Dioxide (% CO2)	Average Carbon Monoxide (%CO)	Average Flue Temp (oF)	Average Air to Fuel Ratio (lb/lb)
180	64.386	0.358	0.44	99.60	74.7	5.00	65.68	229.95	12.50	-0.69	-1.89	11.74	8.01	0.68	316.47	13.17

Average Firebox TopTemp (oF0	Average Firebox Bottom Temp (oF)	Average Firebox Back Temp (oF)	Average Firebox Left Side Temp (oF)	Average Firebox Right Side Temp (oF)	Difference in (Beg./End) Stove Surface Temps (oF)	Average Dilution Tunnel Temp (oF)	Average Dilution Tunnel dP (inches wc)	Average Dilution Tunnel Static Pressure (inches wc)	Average Dilution Tunnel CO2 (%)	Average Laboratory Ambient Temp (oF)
392.74	403.84	392.84	455.53	502.11	96	101.58	0.04	-0.50	0.80	71.16

Wood Heater Calculation Data
EPA Method 5H

Run	4
Manufacturer:	Hearth and Home Tech
Model/Tracking No.:	3100 ACC/862
Test Date:	24-May-06
Project Number:	061-S-66-3

Burn Rate (dry kg/hour) = 1.54

Emission Rate (grams/hour) = 0.77

Note: When using the CO2 tracer-gas method,1/Qf (by tracer gas) = Si

Elapsed Time (minutes)	Dilution Tunnel Velocity (feet/second actual)	Fo (1.00 to 1.12)	Qf by carbon balance (scf/minute)	Qt-new (scf/minute)	Qf by tracer gas (scf/minute)	1/Qf by tracer gas (Si)	Volume Sampled (dscf)	Si * Volume Sampled	Proportional Sample Rate	dH new
0	13.9	1.12		142.1	11.0	0.091				
10	14.2	1.01	14.4	137.7	17.6	0.057	2.812	0.256	100.0	0.828
20	14.3	1.03	18.2	136.5	16.6	0.060	4.696	0.267	102.1	0.737
30	14.3	1.05	17.6	136.9	14.9	0.067	4.529	0.272	102.8	0.593
40	14.2	1.10	14.5	137.8	13.8	0.073	3.873	0.259	98.4	0.505
50	14.1	1.07	13.7	138.5	12.2	0.082	3.678	0.267	101.0	0.399
60	14.0	1.13	10.9	139.0	12.5	0.080	3.290	0.269	101.3	0.412
70	14.0	1.18	8.1	139.8	12.4	0.080	3.227	0.259	98.1	0.410
80	13.9	1.18	4.7	140.5	12.5	0.080	3.230	0.260	98.5	0.415
90	13.8	1.13	3.3	141.2	12.1	0.083	3.260	0.261	98.9	0.389
100	13.8	1.11	4.9	141.5	12.2	0.082	3.250	0.268	101.7	0.394
110	13.8	1.12	3.4	141.9	11.9	0.084	3.106	0.255	96.8	0.373
120	13.7	1.12	3.4	142.1	11.6	0.086	3.007	0.253	96.6	0.355
130	13.7	1.11	3.6	142.1	12.0	0.083	3.089	0.266	101.5	0.380
140	13.7	1.09	3.5	142.3	11.5	0.087	2.989	0.249	95.3	0.349
150	13.7	1.12	3.7	142.3	11.6	0.086	3.076	0.267	102.1	0.357
160	13.7	1.10	3.7	142.3	11.9	0.084	2.995	0.257	98.4	0.371
170	13.7	1.09	1.9	142.4	11.9	0.084	3.103	0.261	99.9	0.372
180	13.7	1.08	1.9	142.4	11.5	0.087	3.088	0.260	99.4	0.347
Averages/Totals	13.9	1.10	7.5	140.5	12.7	0.080	3.350		99.6	0.444

Woodstove Type	
Yhc>1=cat,2=ncat, 3=pellet	2
EPA's Hydrocarbon Constant (%)	1.32
Fuel Data	
Test Charge (as fired lbs)	12.5
Average Moisture (% dry basis)	22.35
Average Moisture (% wet basis)	18.27
Run Parameters	
DGM initial reading (cf)	0.000
DGM final reading (cf)	64.386
Pb (inches Hg)	28.46
Tm (avg oF)	74.68
dH (avg inches wc)	0.44
Vm (scf)	60.244
Qf by carbon balance (avg dscf/minute)	7.51
Analytical Data	
Probe/Front Wash (mg)	11.6
Front Filter (mg)	48.9
Impinger PM (mg)	39.4
Back Filter (mg)	2.5
Total Weight (mg)	102.4
Emission Results	
Cs (g/dscf)	0.0017
ER (g/hour)	**0.77**

Final Laboratory Report - Method 5H
Dilution Tunnel Particulate Calculations

Client Name:	Hearth & Home Technologies	Equipment Numbers:		Run No.:	4
Model:	3100 ACC			Date:	05/24/06
Project No.:	061-S-66-3				
Tracking No.:	862				

PARTICULATE COMPONENTS

Sample Component	Reagent	Filter # or Volume, ml	Weights			
			Final, mg	Tare, mg	Blank, mg/ml	Particulate, mg
A. Front filter catch	Filter	M980	673.3	624.4		48.9
B. Rear filter catch	Filter	D264	147.8	145.3		2.5
C. Rinse of probe and filter assembly (FRONT)	Acetone	50	106673.7	106659.6	0.0500	11.6
D. Rinse of Impinger Set	Distilled Water	300	136044.0	136017.6	0.0010	26.1
E. Rinse of Impinger Set	Dichloromethane	150	101340.8	101340.6	0.0000	0.2
F. Rinse of filter assembly and gas train (BACK)	Acetone	105	108700.6	108682.2	0.0500	13.2
			Total Particulate, mg :			102.4

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 (FRONT)	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg
D. Rinse of Impinger Set	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg
E. Rinse of Impinger Set	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg
F. Rinse of filter assembly and gas train (BACK)	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg

CONDENSED WATER

IMPINGERS	Weights		
	Final, g	Initial, g	Net, g
1	616.0	548.1	67.9
2	668.2	655.4	12.8
3	563.1	560.0	3.1
4	908.0	895.5	12.5
		TOTAL, g:	96.3

Analyst: [signature] Date: 6-19-06

4-30 of 4-50

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

STOVE TEMPERATURE TEST DATA - METHOD 5G

Client/Model: Hearth & Home Tech. 3100 ACC Project #: 061-S-66-3 Tracking #: 861

Date: 5-24-06 Test Crew: B Davis Run #: 4

OMNI Equipment ID #:

Preburn [X] Test [ ]

Coal Bed: Data: 0 = Ø Range: 2.5 - 3.1 Actual: Coal Bed: 2.7

Time	Fuel Weight	Delta Weight	Stack Draft	Ambient	Top	Bottom	Back	Left	Right	Flue	Catalyst
				TEMPERATURES (oF)							
0	8.2	/	-.072	72	810	463	534	622	657	690	NA
10	5.9	2.3	-.071	72	760	466	535	649	683	530	
20	4.7	1.2	-.067	73	657	462	510	624	654	443	
30	3.7	1.0	-.062	73	621	458	498	594	626	430	
40	3.3	0.4	-.050	73	503	461	488	568	618	299	
50	3.0	0.3	-.047	72	398	469	482	531	598	265	
60	2.8	0.2	-.042	71	331	474	457	496	557	268	
63 ~~70~~	2.7	0.1	-.041	71	315	469	442	481	538	260	
80											
90											
00											
10											
20											
30											
40											
50											
60											
70											
80											
90											
AVG											

Technician signature: BD Date: 6-19-06

4-31 of 4-50

FUEL DATA

Client: Hearth & Home Technologies
Model: 3100 ACC
Project #: 061-S-66-3 Tracking #: 862
Date: 5-24-06 Test Crew: B Daws Run #: 4
OMNI Equipment ID #:
FUEL LOAD PREPARED BY: B Daws
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
Cal Value (2) = 22% Actual Reading 22

Piece	Length	Readings			Type
1	24" ~~ft~~	18.3	25.6	24.5	2x4
2	ft				
3	ft				

Length of cut pieces: 8" inches Pre-Burn Fuel Average Moisture: 22.8%

Time (clock): 0815 Room Temperature (F): 75 Initials: BA

TEST FUEL

FUEL TYPE AND AMOUNT: 2 × 4 3 4 × 4 2
CALCULATED LOAD WEIGHT: 13.3 ACTUAL LOAD WEIGHT: 6.6 (2 × 4)
5.9 (4 × 4)
12.5 Total
FUEL PIECE LENGTH: 14"

MOISTURE CONTENT (METER – – DRY BASIS)

PIECE	READINGS			TYPE
1	20.9	19.2	21.1	2x4
2	22.3	21.6	21.9	2x4
3	20.1	21.2	20.3	2x4
4	25.0	23.6	23.8	4x4
5	23.1	25.2	25.9	4x4
6				
7				
8				
9				
10				

OVERALL TEST FUEL LOAD MOISTURE AVERAGE: 22.35

Time (clock): 0815 Room Temperature (F): 75 Initials: BA

Technician signature: BD Date: 6-12-06

4-32 of 4-50

OMNI-Test Laboratories, Inc.
Beaverton, OR

Run Notes

Client/Model: Hearth & Home Technologies
Model: 3100 ACC
Project #: 061-S-66-3
Tracking Number: 862
Run #: 4 Date: 5-24-06
Test Crew: B.D
OMNI Equipment ID Numbers:

PREBURN

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

PRIMARY:

fully open
~~Startup Air~~
Timed Air Not used

SECONDARY: fixed

TERTIARY: NA

FAN: on high

PREBURN SETTINGS AND ACTIVITIES

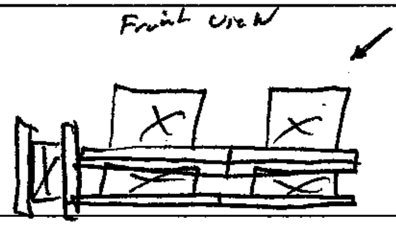
TIME	AIR (THERMO) CHANGES PRIMARY/SECONDARY/TERTIARY	FAN SETTING CHANGE	ADD FUEL + WT.	ADD FUEL - WT.	RAKE COAL	COMMENT
Ø	Test setting					
50					x	

TEST

TEST FUEL CONFIGURATION SKETCH
(INDICATE VIEW ANGLE)

no top spacers

Front view



START UP PROCEDURES

BYPASS: NA
FUEL LOADING: by 45 sec
DOOR: closed by 1:40
PRIMARY AIR: At test setting full 5:00

OTHER: Timed Air pushed @ Zero minutes

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

PRIMARY:

fully open
Timed Air pushed @ Zero minutes
rear Air Not used

SECONDARY: fixed

TERTIARY: NA

FAN: on high.

Technician signature: B.D Date: 6-12-06

4-33 of 4-50

Supplemental Data EPA 5G/5H

Client: Hearth & Home Technologies

Model: 3100 ACC

Project No.: 061-S-66-3 Tracking No.: 862

Date: 5-24-06 Run No.: 4 Booth: 1

Test Crew: B Davis Start Time: 09:50 Stop Time: 12:50

OMNI Equipment #'s:

Gas Analyzer Train Leak Check:

Stack:

Initial: good

Final: good

Dilution Tunnel (Method 5G Only):

Initial: good

Final: good

Calibrations: Span Gas CO_2: 9.9 O_2: 10.48 CO: 1.25 CO_2(DT): 1.25

Time	N_2 Span		N_2 Span		N_2 Span	N_2 Span	N_2 Span	N_2 Span	N_2 Span
	Ø		EOT						
O_2	0.0	10.5	0.0	10.4					
CO_2	0.0	9.9	0.0	9.8					
CO	0.00	1.25	0.00	1.26					
CO_2 (DT)	0.00	1.25	0.01	1.24					

Stack Diameter (inches): 6"

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

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

Induced Draft: 0.0 %Smoke Capture: 100 %

Pitot Tube Leak Test: Pre: 0.0 @ 3.0 Post: 0.0 @ 3.1

Flue Pipe Cleaned Prior to First Test in Series: Date: 5-22-06 Initials: BA

	Initial	Middle	Ending
Pb (in. Hg)	28.52	28.46	28.40
Room Temp (°F)	70	71	70

Technician signature: BD Date: 6-12-06

4-34 of 4-50

Run 5

Wood Heater Test Data
EPA Method 5H

Run Number 5

Manufacturer:	Hearth and Home Tech
Stove Model, Tracking Number:	3100 ACC/862
Stove Type (cat, ncat, or pellet):	ncat
Project Number:	061-S-66-3
Test Date:	24-May-06
Test Start Time:	16:03
Recording Interval (minutes):	10
Total Sampling Time (minutes):	250
Sample Rate Control Module Number:	322
Test Meter 'y':	0.995
Orifice dH@:	1.892
Pitot Tube Cp:	0.99
Average Barometric Pressure:	28.53
Average Fuel Moisture (dry basis %):	20.95
OMNI Equipment Numbers:	

Dilution Tunnel Velocity Traverse Data										Dilution Tunnel Flow
	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8		Initial
Initial dP	0.038	0.042	0.045	0.033	0.039	0.046	0.041	0.027	"H2O	140.7
Initial Temp	95	95	95	95	95	95	95	95	oF	scf/minute

Signature/Date: 6-19-06

Post-Test Leak Check: .006@8" cfm@"Hg

Initial/Assumed Values				
Dilution Tunnel	MW (lb/lb-mol)	28.56	Ambient CO2 (%)	0.034
	H2O (%)	4.00	Preferred Initial Sampling Rate (cf/minute)	0.32

Flue Gas	
Impinger liquid, Vlc (g)	108.4
Volume of Water Vapor, Vw(std) (ft3)	5.11
Moisture Content, Bws	0.067

	Particulate Sampling System								Fuel Weight		Stove Flue-Gas Conditions					
Elapsed Time	Dry Gas Meter Reading (cf)	Sample Rate (cfm)	Orifice dH (inches wc)	Proportional Rate (%)	Dry Gas Meter Temperature (F)	Sample Train Vacuum (inches Hg)	Impinger Exit Temperature (F)	Hot Box Temperature (F)	Scale Reading (lbs)	Weight Change (lbs)	Draft Pressure (inches wc)	O2 (%)	CO2 (%)	CO (%)	Temperature (F)	Air to Fuel Ratio (lb/lb)
0	0.000		0.32		75	0	79	230	13.2		-0.031	11.0	8.9	0.33	207	11.5
10	3.052	0.305	0.55	100.0	76	1	64	229	12.0	-1.2	-0.057	9.8	10.3	0.53	378	10.0
20	7.082	0.403	0.55	100.3	77	1	64	230	10.5	-1.5	-0.057	7.6	12.4	0.21	455	8.7
30	11.085	0.400	0.47	99.4	77	1	66	229	8.9	-1.6	-0.064	6.4	13.6	0.22	478	8.0
40	14.836	0.375	0.39	100.6	77	1	64	230	7.4	-1.5	-0.062	6.4	13.6	0.53	440	7.9
50	18.206	0.337	0.39	99.7	78	1	62	230	6.0	-1.4	-0.061	6.6	13.4	0.33	417	8.1
60	21.552	0.335	0.38	98.5	78	1	64	229	4.8	-1.2	-0.055	8.0	11.9	0.36	384	8.9
70	24.950	0.340	0.37	101.4	78	1	65	230	4.0	-0.8	-0.052	9.1	10.8	0.51	348	9.6
80	28.277	0.333	0.37	100.1	78	1	66	230	3.3	-0.7	-0.050	9.7	10.2	0.41	338	10.2
90	31.640	0.336	0.27	101.5	78	1	68	230	2.7	-0.6	-0.048	10.6	8.4	0.88	313	11.4
100	34.416	0.278	0.31	98.3	77	1	67	231	2.4	-0.3	-0.041	12.2	7.1	0.92	267	13.0
110	37.370	0.295	0.28	97.8	77	1	62	230	2.2	-0.2	-0.037	13.2	6.2	1.20	239	13.9
120	40.345	0.298	0.28	103.1	77	1	60	230	2.0	-0.2	-0.032	13.8	5.6	1.42	220	14.5
130	43.156	0.281	0.26	98.1	78	1	61	230	1.9	-0.1	-0.030	13.9	5.6	1.51	214	14.3
140	46.005	0.285	0.26	101.9	78	1	61	230	1.7	-0.2	-0.030	13.9	5.6	1.43	210	14.5
150	48.700	0.270	0.25	96.7	78	1	61	231	1.5	-0.2	-0.030	14.4	5.2	1.54	204	15.0
160	51.486	0.279	0.26	101.7	78	1	62	231	1.4	-0.1	-0.029	14.2	5.1	1.66	200	14.9
170	54.205	0.272	0.26	97.5	78	1	64	231	1.2	-0.2	-0.028	14.3	5.0	1.64	197	15.2
180	56.905	0.270	0.24	98.2	77	1	65	231	1.0	-0.2	-0.028	14.4	5.0	1.63	193	15.2
190	59.590	0.269	0.25	101.2	77	1	66	230	0.9	-0.1	-0.027	14.5	4.9	1.53	192	15.6
200	62.270	0.268	0.26	99.0	77	1	63	230	0.7	-0.2	-0.027	14.3	5.0	1.58	191	15.3
210	64.970	0.270	0.27	98.4	77	1	62	231	0.6	-0.1	-0.027	14.6	4.9	1.54	191	15.6
220	67.720	0.275	0.29	98.4	77	1	62	231	0.5	-0.1	-0.027	14.6	4.7	1.62	190	15.8
230	70.600	0.288	0.26	98.9	77	1	61	232	0.3	-0.2	-0.027	14.4	5.1	1.63	191	15.0
240	73.390	0.279	0.27	100.6	77	1	62	231	0.2	-0.1	-0.027	14.7	4.7	1.68	191	15.7
250	76.140	0.275	0.26	97.7	77	1	62	230	0.0	-0.2	-0.027	14.6	4.8	1.76	191	15.3
Total Sampling Time (minutes)	Total Sample Volume (cf)	Average Sampling Rate (cfm)	Average Orifice dH (inches wc)	Average Proportional Rate (%)	Average Meter Temp (oF)	Maximum Sample Train Vacuum (inches Hg)	Average Impinger Exit Temperature (F)	Average Hot Box Interior Temp (oF)	Total Fuel Burned (lbs)	Average Sample Interval Weight Change	Average Flue Draft (inches wc)	Average Oxygen (% O2)	Average Carbon Dioxide (% CO2)	Average Carbon Monoxide (%CO)	Average Flue Temp (oF)	Average Air to Fuel Ratio (lb/lb)
250	76.140	0.305	0.32	99.55	77.3	1.00	63.96	230.27	13.20	-0.53	-0.04	11.97	7.62	1.10	270.73	12.81

	Stove Temperatures (oF)						Dilution Tunnel				Laboratory
Elapsed Time	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Average Surface Temperature (F)	Temperature (F)	dP Velocity Pressure (inches wc)	Static Pressure (inches wc)	CO2 (%)	Ambient Temperature (F)
0	271	438	385	426	462	396	95	0.039	-0.50	0.630	73
10	347	420	329	386	413	379	102	0.039	-0.50	0.940	73
20	560	398	298	398	415	414	114	0.039	-0.50	1.140	73
30	620	385	298	435	437	435	118	0.039	-0.50	1.160	73
40	644	374	312	486	475	458	113	0.039	-0.50	1.050	73
50	601	386	329	521	511	466	111	0.039	-0.50	1.040	74
60	564	362	350	554	551	476	107	0.039	-0.50	0.910	73
70	500	361	365	547	563	467	104	0.039	-0.50	0.820	74
80	469	361	380	534	571	463	101	0.039	-0.50	0.770	72
90	440	361	391	506	566	453	98	0.039	-0.50	0.550	72
100	381	362	398	473	571	437	93	0.039	-0.50	0.500	73
110	329	365	382	440	520	407	89	0.039	-0.50	0.420	72
120	281	367	368	411	475	382	87	0.039	-0.50	0.380	72
130	271	367	359	392	448	367	86	0.039	-0.50	0.370	73
140	257	365	350	376	429	355	87	0.039	-0.50	0.370	74
150	249	363	346	365	418	348	86	0.039	-0.50	0.340	74
160	242	360	344	357	401	341	86	0.039	-0.50	0.340	74
170	237	356	342	350	391	335	86	0.039	-0.50	0.330	74
180	228	349	337	340	382	327	86	0.039	-0.50	0.320	74
190	225	346	335	337	349	318	86	0.039	-0.50	0.320	74
200	222	343	335	333	376	322	86	0.039	-0.50	0.330	74
210	219	341	339	330	373	320	87	0.039	-0.50	0.330	74
220	217	339	341	329	370	319	87	0.039	-0.50	0.330	73
230	217	338	341	329	366	318	87	0.039	-0.50	0.340	73
240	217	337	341	330	364	318	86	0.039	-0.50	0.320	73
250	216	336	342	330	362	317	87	0.039	-0.50	0.320	73
	Average Firebox TopTemp (oF)	Average Firebox Bottom Temp (oF)	Average Firebox Back Temp (oF)	Average Firebox Left Side Temp (oF)	Average Firebox Right Side Temp (oF)	Difference in (Beg./End) Stove Surface Temps (oF)	Average Dilution Tunnel Temp (oF)	Average Dilution Tunnel dP (inches wc)	Average Dilution Tunnel Static Pressure (inches wc)	Average Dilution Tunnel CO2 (%)	Average Laboratory Ambient Temp (oF)
250	347.46	363.85	347.58	408.27	444.58	79	94.42	0.04	-0.50	0.56	73.23

Wood Heater Calculation Data
EPA Method 5H

Run	5

Manufacturer: Hearth and Home Tech

Model/Tracking No.: 3100 ACC/862

Test Date: 24-May-06

Project Number: 061-S-66-3

Burn Rate (dry kg/hour) = 1.19

Emission Rate (grams/hour) = 0.82

Note: When using the CO2 tracer-gas method,1/Qf (by tracer gas) = Si

Elapsed Time (minutes)	Dilution Tunnel Velocity (feet/second actual)	Fo (1.00 to 1.12)	Qf by carbon balance (scf/minute)	Qt-new (scf/minute)	Qf by tracer gas (scf/minute)	1/Qf by tracer gas (Si)	Volume Sampled (dscf)	Si * Volume Sampled	Proportional Sample Rate	dH new
0	13.7	1.09		140.7	9.5	0.106				
10	13.9	1.05	13.4	140.5	12.4	0.081	2.860	0.302	100.0	0.550
20	14.0	1.06	14.6	139.0	12.4	0.080	3.772	0.304	100.3	0.552
30	14.1	1.06	14.3	138.6	11.5	0.087	3.740	0.301	99.4	0.472
40	14.0	1.04	13.1	139.2	10.4	0.096	3.503	0.305	100.6	0.388
50	14.0	1.05	12.6	139.4	10.5	0.095	3.147	0.302	99.7	0.392
60	14.0	1.07	11.9	139.9	10.3	0.097	3.119	0.297	98.5	0.380
70	13.9	1.07	8.6	140.3	10.2	0.098	3.167	0.307	101.4	0.374
80	13.9	1.07	7.9	140.6	10.2	0.098	3.101	0.303	100.1	0.369
90	13.8	1.16	7.7	141.0	8.7	0.115	3.134	0.308	101.5	0.270
100	13.8	1.14	4.3	141.7	9.3	0.107	2.587	0.297	98.3	0.312
110	13.7	1.12	3.1	142.2	8.9	0.112	2.758	0.295	97.8	0.283
120	13.7	1.11	3.2	142.4	8.9	0.113	2.777	0.312	103.1	0.280
130	13.7	1.09	1.6	142.6	8.6	0.116	2.624	0.296	98.1	0.264
140	13.7	1.10	3.2	142.4	8.6	0.116	2.655	0.308	101.9	0.263
150	13.7	1.08	3.4	142.6	8.4	0.118	2.511	0.292	96.7	0.254
160	13.7	1.11	1.7	142.6	8.6	0.116	2.596	0.307	101.7	0.264
170	13.7	1.12	3.4	142.6	8.5	0.118	2.533	0.294	97.5	0.257
180	13.7	1.10	3.4	142.6	8.2	0.122	2.516	0.296	98.2	0.241
190	13.7	1.11	1.7	142.6	8.4	0.119	2.506	0.305	101.2	0.251
200	13.7	1.12	3.4	142.6	8.5	0.118	2.502	0.299	99.0	0.258
210	13.7	1.10	1.7	142.4	8.7	0.115	2.520	0.297	98.4	0.268
220	13.7	1.13	1.8	142.4	9.0	0.111	2.567	0.296	98.4	0.291
230	13.7	1.09	3.4	142.4	8.6	0.116	2.689	0.298	98.9	0.264
240	13.7	1.10	1.8	142.6	8.7	0.114	2.604	0.303	100.6	0.273
250	13.7	1.09	3.4	142.4	8.5	0.117	2.567	0.294	97.7	0.261
Averages/Totals	13.8	1.09	5.9	141.5	9.4	0.108	2.842		99.6	0.321

Woodstove Type	
Yhc>1=cat,2=ncat, 3=pellet	2
EPA's Hydrocarbon Constant (%)	1.32
Fuel Data	
Test Charge (as fired lbs)	13.2
Average Moisture (% dry basis)	20.95
Average Moisture (% wet basis)	17.32
Run Parameters	
DGM initial reading (cf)	0.000
DGM final reading (cf)	76.140
Pb (inches Hg)	28.53
Tm (avg oF)	77.27
dH (avg inches wc)	0.32
Vm (scf)	71.052
Qf by carbon balance (avg dscf/minute)	5.94
Analytical Data	
Probe/Front Wash (mg)	21.1
Front Filter (mg)	34.4
Impinger PM (mg)	93.3
Back Filter (mg)	14.3
Total Weight (mg)	163.2
Emission Results	
Cs (g/dscf)	0.0023
ER (g/hour)	**0.82**

Final Laboratory Report - Method 5H
Dilution Tunnel Particulate Calculations

Client Name:	Hearth & Home Technologies	Equipment Numbers:		Run No.:	5
Model:	3100 ACC			Date:	05/24/06
Project No.:	061-S-66-3				
Tracking No.:	862				

PARTICULATE COMPONENTS

Sample Component	Reagent	Filter # or Volume, ml	Weights			
			Final, mg	Tare, mg	Blank, mg/ml	Particulate, mg
A. Front filter catch	Filter	M981	653.3	618.9		34.4
B. Rear filter catch	Filter	D265	159.0	144.7		14.3
C. Rinse of probe and filter assembly (FRONT)	Acetone	75	109104.8	109083.3	0.0050	21.1
D. Rinse of Impinger Set	Distilled Water	300	131281.6	131241.4	0.0010	39.9
E. Rinse of Impinger Set	Dichloromethane	150	109577.5	109563.0	0.0000	14.5
F. Rinse of filter assembly and gas train (BACK)	Acetone	135	109220.6	109181.0	0.0050	38.9
			Total Particulate, mg :			163.2

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 (FRONT)	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg
D. Rinse of Impinger Set	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg
E. Rinse of Impinger Set	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg
F. Rinse of filter assembly and gas train (BACK)	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg

CONDENSED WATER	Weights		
IMPINGERS	Final, g	Initial, g	Net, g
1	627.7	547.2	80.5
2	661.2	652.3	8.9
3	560.7	560.0	0.7
4	866.4	848.1	18.3
		TOTAL, g:	108.4

Analyst: *BG* Date: *6-12-06*

JMI t Lat ries,
Beaverton, OR Phone (503) 643-3788

STOVE TEMPERATURE TEST DATA - METHOD 5G

Client/Model: Hearth & Home Tech 3100 ACC Project #: 061-S-66-3 Tracking #: 862

Date: 5-24-06 Test Crew: B Davis Run #: 5

OMNI Equipment ID #: ______

Preburn [X] Test [ ] Coal Bed: Data: 0 = Ø Range: 2.7-3.3 Actual: Coal Bed: 3.1

Time	Fuel Weight	Delta Weight	Stack Draft	Ambient	Top	Bottom	Back	Left	Right	Flue	Catalyst
				TEMPERATURES (oF)							
0	6.8	—	-.054	77	576	494	633	669	728	392	
10	5.9	0.9	-.058	77	529	509	596	634	691	365	
20	5.2	0.7	-.052	76	486	504	539	584	641	341	
30	4.5	0.7	-.052	75	476	486	496	540	597	346	
40	4.0	0.5	-.043	74	449	464	464	514	566	301	
50	3.2	0.6	-.037	73	358	454	442	484	535	250	
60	3.1	0.1	-.031	73	290	444	403	446	485	214	
63 ~~70~~	3.1	0.0	-.031	73	275	440	389	430	467	208	
80											
90											
00											
10											
20											
30											
40											
50											
60											
70											
80											
90											
AVG											

Technician signature: B D Date: 6-12-06

OMNI-Test Laboratories, Inc.
Beaverton, OR

FUEL DATA

Client: Hearth & Home Technologies
Model: 3100 ACC
Project #: 061-S-66-3 Tracking #: 862
Date: 5-24-06 Test Crew: B Davis Run #: 5
OMNI Equipment ID #:
FUEL LOAD PREPARED BY: B Davis
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
Cal Value (2) = 22% Actual Reading 22

Piece	Length	Readings			Type
1	24" ~~ft~~	19.9	18.8	21.0	2x4
2	ft				
3	ft				

Length of cut pieces: 8" inches Pre-Burn Fuel Average Moisture: 19.9%

Time (clock): 14:25 Room Temperature (F): 75 Initials: BR

TEST FUEL

FUEL TYPE AND AMOUNT: 2 × 4 3 4 × 4 2
CALCULATED LOAD WEIGHT: 13.3 ACTUAL LOAD WEIGHT: 6.4 (2 × 4)
6.8 (4 × 4)
13.2 Total

FUEL PIECE LENGTH: 14"

MOISTURE CONTENT (METER -- DRY BASIS)

PIECE	READINGS			TYPE
1	21.6	24.1	18.3	4x4
2	21.9	22.5	22.0	4x4
3	23.1	21.1	23.6	2x4
4	19.0	19.1	19.3	2x4
5	19.3	19.9	19.5	2x4
6				
7				
8				
9				
10				

OVERALL TEST FUEL LOAD MOISTURE AVERAGE: 20.95

Time (clock): 14:30 Room Temperature (F): 75 Initials: BR

Technician signature: B Davis Date: 6-12-06

OMNI-Test Laboratories, Inc.
Beaverton, OR

Run Notes

Client/Model: Hearth & Home Technologies
Model: 3100 ACC
Project #: 061-S-66-3
Tracking Number: 862
Run #: 5 Date: 5-24-06
Test Crew: B Davis
OMNI Equipment ID Numbers:

PREBURN

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

PRIMARY:

1.125"

///= closed Area

Timed Air Not used
Rear Air Not used

SECONDARY: fixed

TERTIARY: NA

FAN: On High

PREBURN SETTINGS AND ACTIVITIES

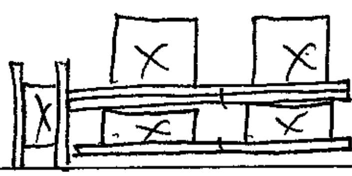
TIME	AIR (THERMO) CHANGES PRIMARY/SECONDARY/TERTIARY	FAN SETTING CHANGE	ADD FUEL + WT.	ADD FUEL - WT.	RAKE COAL	COMMENT
Ø	Test setting					
45				0.4	x	→
50					x	→

TEST

TEST FUEL CONFIGURATION SKETCH
(INDICATE VIEW ANGLE)

Leftside ←

Front view No Top Spaces



START UP PROCEDURES
BYPASS: NA
FUEL LOADING: By 50 seconds
DOOR: closed by 1:40
PRIMARY AIR: @ test setting full 5:00

OTHER: Timed Air pushed at 0 minutes
Rear air Not used

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

PRIMARY:

1.125" open
Timed Air pushed @ zero minutes
Rear Air Not used.

SECONDARY: fixed

TERTIARY: NA

FAN: On High

Technician signature: [signature] Date: 6-12-06

OMNI-Test Laboratories, Inc.
Beaverton, OR

Supplemental Data EPA 5G/5H

Client: Hearth & Home Technologies

Model: 3100 ACC

Project No.: 061-S-66-3 Tracking No.: 862

Date: 5-24-06 Run No.: 5 Booth: 1

Test Crew: BO Start Time: 16:03 Stop Time: 20:13

OMNI Equipment #'s:

Gas Analyzer Train Leak Check:

Stack:
Initial: good
Final: good

Dilution Tunnel (Method 5G Only):
Initial: good
Final: good

Calibrations: Span Gas CO_2: 9.9 O_2: 10.48 CO: 1.25 CO_2(DT): 1.25

Time	N_2 Span		N_2 Span		N_2 Span	N_2 Span	N_2 Span	N_2 Span	N_2 Span
	ø		EOT						
O_2	0.0	10.4	0.0	10.3					
CO_2	0.0	9.9	0.0	10.0					
CO	0.00	1.24	0.00	1.26					
CO_2 (DT)	0.00	1.24	0.01	1.24					

Stack Diameter (inches): 6"

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

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

Induced Draft: 0.0 %Smoke Capture: 100%

Pitot Tube Leak Test: Pre: 0.0 @ 3.4 Post: 0.0 @ 3.1

Flue Pipe Cleaned Prior to First Test in Series: Date: 5-22-06 Initials: BR

	Initial	Middle	Ending
Pb (in. Hg)	28.50	28.53	28.56
Room Temp (°F)	73	73	73

Technician signature: [signature] Date: 6-12-06

4-42 of 4-50

Model: 3100 ACC
Hearth and Home Technologies
1445 North Highway
Colville, WA 99114

Run 6

Wood Heater Test Data
EPA Method 5H

Run Number 6

Manufacturer:	Hearth and Home Tech
Stove Model, Tracking Number:	3100 ACC/862
Stove Type (cat, ncat, or pellet):	ncat
Project Number:	061-S-68-3
Test Date:	25-May-06
Test Start Time:	10:01
Recording Interval (minutes):	10
Total Sampling Time (minutes):	240

Sample Rate Control Module Number:	322
Test Meter 'y':	0.995
Orifice dH@:	1.692
Pitot Tube Cp:	0.99
Average Barometric Pressure:	28.46
Average Fuel Moisture (dry basis %):	20.95
OMNI Equipment Numbers:	

Dilution Tunnel Velocity Traverse Data										Dilution Tunnel Flow
	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8		Initial
Initial dP	0.043	0.047	0.045	0.027	0.040	0.046	0.047	0.037	"H2O	145.4
Initial Temp	93	93	93	93	93	93	93	93	oF	scf/minute

Signature/Date: BC 6-19-06

Post-Test Leak Check: .011@11" cfm@"Hg

Initial/Assumed Values				
Dilution	MW (lb/lb-mol)	28.56	Ambient CO2 (%)	0.034
Tunnel	H2O (%)	4.00	Preferred Initial Sampling Rate (cf/minute)	0.31

Flue Gas	
Impinger liquid, Vlc (g)	123.6
Volume of Water Vapor, Vw(std) (ft3)	5.83
Moisture Content, Bws	0.071

	Particulate Sampling System								Fuel Weight		Stove Flue-Gas Conditions						Stove Temperatures (oF)						Dilution Tunnel				Laboratory
Elapsed Time	Dry Gas Meter Reading (cf)	Sample Rate (cfm)	Orifice dH (inches wc)	Proportional Rate (%)	Dry Gas Meter Temperature (F)	Sample Train Vacuum (inches Hg.)	Impinger Exit Temperature (F)	Hot Box Temperature (F)	Scale Reading (lbs)	Weight Change (lbs)	Draft Pressure (inches wc)	O2 (%)	CO2 (%)	CO (%)	Temperature (F)	Air to Fuel Ratio (lb/lb)	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Average Surface Temperature (F)	Temperature (F)	dP Velocity Pressure (inches wc)	Static Pressure (inches wc)	CO2 (%)	Ambient Temperature (F)
0	0.000		0.31		65	0	72	230	13.0		-0.040	11.2	8.8	0.16	247	11.8	420	444	516	497	540	483	93	0.041	-0.52	0.560	70
10	2.920	0.292	0.60	100.0	69	1	65	231	11.8	-1.2	-0.056	8.6	11.3	0.22	429	9.5	525	429	450	457	487	470	109	0.041	-0.52	1.150	69
20	7.740	0.482	0.76	100.5	70	1	62	230	10.0	-1.8	-0.058	7.2	12.3	0.37	490	8.7	725	409	417	476	484	502	119	0.041	-0.52	1.230	69
30	12.404	0.466	0.58	99.7	71	1	65	231	8.3	-1.7	-0.068	6.3	13.2	0.81	498	7.9	777	391	419	516	508	522	122	0.041	-0.52	1.160	70
40	16.570	0.417	0.46	101.1	72	1	66	230	6.8	-1.5	-0.062	7.4	12.2	0.19	433	8.9	741	377	434	550	534	527	114	0.041	-0.52	0.950	70
50	20.256	0.369	0.48	100.6	73	1	67	231	5.8	-1.0	-0.059	9.1	10.4	0.13	398	10.3	678	368	443	554	545	518	110	0.041	-0.52	0.830	70
60	23.979	0.372	0.44	99.2	73	1	65	230	4.8	-1.0	-0.054	8.4	11.4	0.15	398	9.4	668	360	448	556	559	518	109	0.041	-0.52	0.870	70
70	27.555	0.358	0.45	99.5	74	1	64	230	3.8	-1.0	-0.056	8.8	10.9	0.26	389	9.7	658	353	459	561	575	521	108	0.041	-0.52	0.840	71
80	31.146	0.359	0.38	98.9	75	1	64	230	3.0	-0.8	-0.052	9.2	9.9	0.53	366	10.3	634	350	474	558	608	525	105	0.041	-0.52	0.710	72
90	34.504	0.336	0.42	99.7	75	1	65	230	2.5	-0.5	-0.048	11.2	7.9	0.54	326	12.4	572	350	495	552	604	515	102	0.041	-0.52	0.600	71
100	37.915	0.341	0.42	96.6	75	1	68	230	2.2	-0.3	-0.042	12.4	6.7	0.80	298	13.7	516	352	502	534	573	495	99	0.041	-0.52	0.510	71
110	41.477	0.356	0.35	101.2	75	1	60	230	2.0	-0.2	-0.040	13.2	6.1	1.10	267	14.2	450	355	500	500	538	469	96	0.041	-0.52	0.430	70
120	44.689	0.321	0.36	99.6	75	1	57	231	1.8	-0.2	-0.040	13.3	6.2	0.94	257	14.3	420	369	502	477	514	456	93	0.041	-0.52	0.440	71
130	47.938	0.325	0.35	99.7	75	1	57	230	1.7	-0.1	-0.037	13.7	6.0	0.91	250	14.7	395	364	503	458	494	443	91	0.041	-0.52	0.420	70
140	51.180	0.324	0.42	100.9	75	1	57	230	1.5	-0.2	-0.035	14.2	5.5	1.01	241	15.5	383	367	494	448	478	434	89	0.041	-0.52	0.420	70
150	54.714	0.353	0.32	100.6	75	1	58	230	1.4	-0.1	-0.037	14.2	5.6	0.93	232	15.4	366	368	477	436	456	421	88	0.041	-0.52	0.380	71
160	57.840	0.313	0.29	100.9	75	1	59	230	1.2	-0.2	-0.037	14.0	5.9	1.02	231	14.7	356	364	468	427	442	411	91	0.041	-0.52	0.380	71
170	60.863	0.302	0.23	102.9,	75	1	63	230	1.0	-0.2	-0.032	14.0	5.8	1.11	228	14.7	350	367	466	420	434	407	90	0.041	-0.52	0.340	71
180	63.430	0.257	0.29	97.2	74	1	66	230	0.9	-0.1	-0.031	14.0	5.7	1.21	223	14.7	344	365	463	417	427	403	91	0.041	-0.52	0.370	72
190	66.431	0.300	0.28	101.9	75	1	68	230	0.7	-0.2	-0.030	14.2	5.5	1.22	219	15.1	338	362	462	410	421	399	92	0.041	-0.52	0.350	72
200	69.240	0.281	0.26	97.8	75	1	67	231	0.5	-0.2	-0.030	14.2	5.3	1.30	218	15.3	334	359	462	405	418	396	93	0.041	-0.52	0.330	73
210	72.156	0.292	0.32	104.3	76	1	67	230	0.4	-0.1	-0.030	14.2	5.3	1.34	217	15.2	330	356	460	402	413	392	93	0.041	-0.52	0.360	73
220	75.269	0.311	0.34	100.9	77	1	66	230	0.2	-0.2	-0.030	14.1	5.3	1.32	216	15.2	327	352	457	400	409	389	94	0.041	-0.52	0.370	74
230	78.336	0.307	0.35	96.5	77	1	66	230	0.1	-0.1	-0.030	14.6	4.9	1.43	215	15.8	326	350	456	400	404	387	94	0.041	-0.52	0.350	74
240	81.442	0.311	0.35	96.2	77	1	65	230	0.0	-0.1	-0.030	14.7	4.9	1.25	212	16.2	322	347	448	395	402	383	94	0.041	-0.52	0.350	75
Total Sampling Time (minutes)	Total Sample Volume (cf)	Average Sampling Rate (cfm)	Average Orifice dH (inches wc)	Average Proportional Rate (%)	Average Meter Temp (oF)	Maximum Sample Train Vacuum (inches Hg)	Average Impinger Exit Temperature (F)	Average Hot Box Interior Temp (oF)	Total Fuel Burned (lbs)	Average Sample Interval Weight Change	Average Flue Draft (inches wc)	Average Oxygen (% O2)	Average Carbon Dioxide (% CO2)	Average Carbon Monoxide (%CO)	Average Flue Temp (oF)	Average Air to Fuel Ratio (lb/lb)	Average Firebox TopTemp (oF0	Average Firebox Bottom Temp (oF)	Average Firebox Back Temp (oF)	Average Firebox Left Side Temp (oF)	Average Firebox Right Side Temp (oF)	Difference in (Beg./End) Stove Surface Temps (oF)	Average Dilution Tunnel Temp (oF)	Average Dilution Tunnel dP (inches wc)	Average Dilution Tunnel Static Pressure (inches wc)	Average Dilution Tunnel CO2 (%)	Average Laboratory Ambient Temp (oF)
240	81.442	0.339	0.40	99.86	73.9	1.00	63.96	230.20	13.00	-0.54	-0.04	11.86	7.72	0.81	299.92	12.95	478.20	369.12	466.96	472.24	490.68	100	99.16	0.04	-0.52	0.59	71.20

OMNI-Test Laboratories

Wood Heater Calculation Data
EPA Method 5H

Run	6
Manufacturer:	Hearth and Home Tech
Model/Tracking No.:	3100 ACC/862
Test Date:	25-May-06
Project Number:	061-S-66-3

Burn Rate (dry kg/hour) = 1.22

Emission Rate (grams/hour) = 0.62

Note: When using the CO2 tracer-gas method,1/Qf (by tracer gas) = Si

Elapsed Time (minutes)	Dilution Tunnel Velocity (feet/second actual)	Fo (1.00 to 1.12)	Qf by carbon balance (scf/minute)	Qt-new (scf/minute)	Qf by tracer gas (scf/minute)	1/Qf by tracer gas (Si)	Volume Sampled (dscf)	Si * Volume Sampled	Proportional Sample Rate	dH new
0	14.2	1.09		145.4	8.7	0.115				
10	14.3	1.08	12.6	143.0	14.2	0.071	2.782	0.319	100.0	0.800
20	14.5	1.10	17.4	141.8	13.8	0.072	4.563	0.322	100.5	0.760
30	14.5	1.07	15.0	141.4	12.1	0.083	4.406	0.319	99.7	0.581
40	14.4	1.10	14.8	142.4	10.7	0.093	3.927	0.325	101.1	0.455
50	14.4	1.13	11.4	142.9	11.0	0.091	3.466	0.323	100.6	0.476
60	14.3	1.09	10.5	143.0	10.5	0.095	3.495	0.319	99.2	0.438
70	14.3	1.10	10.8	143.1	10.6	0.094	3.357	0.319	99.5	0.445
80	14.3	1.15	9.2	143.5	9.8	0.102	3.364	0.317	98.9	0.381
90	14.3	1.18	6.9	143.9	10.4	0.097	3.140	0.319	99.7	0.422
100	14.2	1.19	4.6	144.3	10.3	0.097	3.190	0.308	96.6	0.418
110	14.2	1.15	3.2	144.7	9.4	0.106	3.331	0.323	101.2	0.351
120	14.1	1.13	3.2	145.1	9.6	0.105	3.003	0.318	99.6	0.360
130	14.1	1.11	1.6	145.3	9.4	0.106	3.038	0.318	99.7	0.348
140	14.1	1.11	3.5	145.6	10.3	0.097	3.031	0.322	100.9	0.417
150	14.1	1.10	1.7	145.7	9.1	0.110	3.305	0.321	100.6	0.323
160	14.1	1.07	3.3	145.3	8.6	0.117	2.922	0.323	100.9	0.290
170	14.1	1.08	3.3	145.5	7.7	0.130	2.826	0.330	102.9	0.235
180	14.1	1.09	1.6	145.3	8.6	0.116	2.399	0.311	97.2	0.293
190	14.1	1.09	3.4	145.2	8.4	0.119	2.811	0.326	101.9	0.278
200	14.1	1.11	3.4	145.1	8.2	0.123	2.626	0.313	97.8	0.262
210	14.1	1.11	1.7	145.1	9.0	0.111	2.726	0.334	104.3	0.317
220	14.2	1.13	3.4	144.9	9.2	0.108	2.905	0.323	100.9	0.336
230	14.2	1.11	1.8	144.9	9.4	0.106	2.857	0.309	96.5	0.348
240	14.2	1.11	1.8	144.9	9.4	0.106	2.893	0.307	96.2	0.348
Averages/Totals	14.2	1.11	6.3	144.3	9.9	0.103	3.182		99.9	0.403

Woodstove Type	
Yhc>1=cat,2=ncat, 3=pellet	2
EPA's Hydrocarbon Constant (%)	1.32
Fuel Data	
Test Charge (as fired lbs)	13
Average Moisture (% dry basis)	20.95
Average Moisture (% wet basis)	17.32
Run Parameters	
DGM initial reading (cf)	0.000
DGM final reading (cf)	81.442
Pb (inches Hg)	28.46
Tm (avg oF)	73.92
dH (avg inches wc)	0.40
Vm (scf)	76.305
Qf by carbon balance (avg dscf/minute)	6.26
Analytical Data	
Probe/Front Wash (mg)	11.8
Front Filter (mg)	36.9
Impinger PM (mg)	67.1
Back Filter (mg)	11.1
Total Weight (mg)	126.9
Emission Results	
Cs (g/dscf)	0.0017
ER (g/hour)	**0.62**

Final Laboratory Report - Method 5H
Dilution Tunnel Particulate Calculations

Client Name:	Hearth & Home Technologies	Equipment Numbers:		Run No.:	6
Model:	3100 ACC			Date:	05/25/06
Project No.:	061-S-66-3				
Tracking No.:	862				

PARTICULATE COMPONENTS

Sample Component	Reagent	Filter # or Volume, ml	Weights			
			Final, mg	Tare, mg	Blank, mg/ml	Particulate, mg
A. Front filter catch	Filter	M982	663.9	627.0		36.9
B. Rear filter catch	Filter	D266	156.1	145.0		11.1
C. Rinse of probe and filter assembly (FRONT)	Acetone	50	109138.4	109123.7	0.0576	11.8
D. Rinse of Impinger Set	Distilled Water	300	124651.0	124616.4	0.0010	34.3
E. Rinse of Impinger Set	Dichloromethane	150	94671.1	94662.6	0.0000	8.5
F. Rinse of filter assembly and gas train (BACK)	Acetone	105	109786.9	109756.6	0.0576	24.3
			Total Particulate, mg :			126.9

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 (FRONT)	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg
D. Rinse of Impinger Set	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg
E. Rinse of Impinger Set	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg
F. Rinse of filter assembly and gas train (BACK)	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg

CONDENSED WATER

IMPINGERS	Weights		
	Final, g	Initial, g	Net, g
1	636.8	546.2	90.6
2	665.6	655.5	10.1
3	561.1	560.0	1.1
4	889.9	868.1	21.8
		TOTAL, g:	123.6

Analyst: BC [signature] Date: 6-12-06

OM   st ...   orie.
Beaverton, OR   Phone (503) 643-3788

STOVE TEMPERATURE TEST DATA - METHOD 5G

Client/Model: Heath & Home Tech 3100 ACC Project #: 061-S-66-3 Tracking #: 861

Date: 5-25-06 Test Crew: B Davis Run #: 6

OMNI Equipment ID #:

Preburn [X]
Test [ ]

Coal Bed: Data: 0 = Ø Range: 2.6 - 3.2

Actual: Coal Bed: 2.7

Time	Fuel Weight	Delta Weight	Stack Draft	Ambient	Top	Bottom	Back	Left	Right	Flue	Catalyst
0	6.6	—	-.067	69	760	475	608	685	723	500	NA
10	5.3	1.3	-.061	70	720	490	633	667	692	390	
20	4.5	0.8	-.052	69	662	480	603	616	646	365	
30	3.7	0.8	-.055	70	648	466	581	584	629	369	
40	3.1	0.6	-.050	70	607	456	568	567	615	330	
50	2.9	0.2	-.048	70	503	450	553	542	590	282	
60	2.7	0.2	-.040	70	432	446	525	508	553	251	
70											
80											
90											
00											
10											
20											
30											
40											
50											
60											
70											
80											
90											
AVG											

Technician signature: BD Date: 6-12-06

4-47 of 4-50

FUEL DATA

Client: Hearth & Home Technologies
Model: 3100 ACC
Project #: 061-S-66-3 Tracking #: 862
Date: 5-25-06 Test Crew: B. Davis Run #: 6
OMNI Equipment ID #: ______
FUEL LOAD PREPARED BY: B Davis
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
Cal Value (2) = 22% Actual Reading 22

Piece	Length	Readings			Type
1	24" ~~ft~~	25	18.7	21.2	2×4
2	ft				
3	ft				

Length of cut pieces: 3 @ 8" inches Pre-Burn Fuel Average Moisture:

Time (clock): 0825 Room Temperature (F): 65 Initials: BR

TEST FUEL

FUEL TYPE AND AMOUNT: 2 × 4 3 4 × 4 2
CALCULATED LOAD WEIGHT: 13.3 ACTUAL LOAD WEIGHT: 6.3 (2 × 4)
6.7 (4 × 4)
13.0 Total
FUEL PIECE LENGTH: 14"

MOISTURE CONTENT (METER - - DRY BASIS)

PIECE	READINGS			TYPE
1	19.7	20.6	19.4	4×4
2	22.5	21.4	19.2	4.0
3	19.8	18.9	20.9	2×4
4	24.5	23.3	23.1	2×4
5	20.0	20.8	20.2	2×4
6				
7				
8				
9				
10				

OVERALL TEST FUEL LOAD MOISTURE AVERAGE: 20.95

Time (clock): 0830 Room Temperature (F): 65 Initials: BR

Technician signature: B Davis Date: 6-12-06

OMNI-Test Laboratories, Inc.
Beaverton, OR

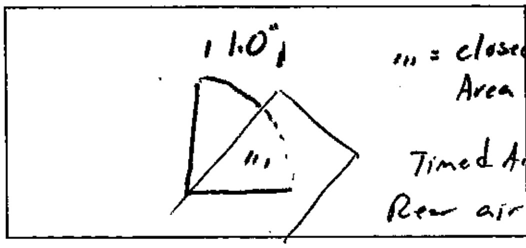
Run Notes

Client/Model: Hearth & Home Technologies
Model: 3100 ACC
Project #: 061-S-66-3
Tracking Number: 862
Run #: 6 Date: 5-25-06
Test Crew: B Davis
OMNI Equipment ID Numbers:

PREBURN

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

PRIMARY:



Timed Air not used
Rear air not used

SECONDARY: fixed

TERTIARY: NA

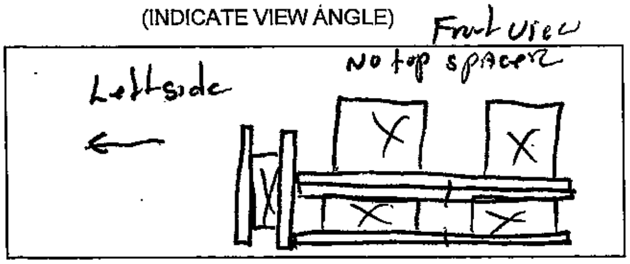
FAN: off
fan Confirmation

PREBURN SETTINGS AND ACTIVITIES

TIME	AIR (THERMO) CHANGES PRIMARY/SECONDARY/TERTIARY	FAN SETTING CHANGE	ADD FUEL + WT.	ADD FUEL - WT.	RAKE COAL	COMMENT
Ø	Test setting					
50					x	

TEST

TEST FUEL CONFIGURATION SKETCH
(INDICATE VIEW ANGLE) Front used



START UP PROCEDURES
BYPASS: NA
FUEL LOADING: By 42 seconds
DOOR: closed by 1:40 minutes
PRIMARY AIR: at test setting full 5100

OTHER: Timed Air pushed at Ø minutes
Rear air not used.

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

1.0" open
Timed Air open @ Ø minutes
Rear Air Not used.

SECONDARY: fixed

TERTIARY: NA

FAN: off
fan Confirmation

Technician signature: BD Date: 6-12-06

OMNI-Test Laboratories, Inc.
Beaverton, OR

Supplemental Data EPA 5G/5H

Client: Hearth & Home Technologies

Model: 3100 ACC

Project No.: 061-S-66-3 Tracking No.: 862

Date: 5-25-06 Run No.: 6 Booth: 1

Test Crew: BQ Start Time: 10:01 Stop Time: 14:01

OMNI Equipment #'s:

Gas Analyzer Train Leak Check:

Stack:
Initial: good
Final: good

Dilution Tunnel (Method 5G Only):
Initial: good
Final: good

Calibrations: Span Gas CO_2: 9.9 O_2: 10.48 CO: 1.25 CO_2(DT): 1.25

Time	N_2 Span Ø		N_2 Span EOT		N_2 Span	N_2 Span	N_2 Span	N_2 Span	N_2 Span
O_2	0.0	10.4	0.0	10.3					
CO_2	0.0	9.9	0.0	9.9					
CO	0.00	1.25	0.00	1.23					
CO_2 (DT)	0.00	1.24	0.00	1.23					

Stack Diameter (inches): 6"

Air Velocity (ft/min): Initial: 250 ft/min Final: 250 ft/min

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

Induced Draft: 0.0 %Smoke Capture: 100%

Pitot Tube Leak Test: Pre: 0.0 @ 3.0 Post: 0.0 @ 3.1

Flue Pipe Cleaned Prior to First Test in Series: Date: 5-22-06 Initials: BR

	Initial	Middle	Ending
Pb (in. Hg)	28.52	28.46	28.40
Room Temp (°F)	70	72	75

Technician signature: [signature] Date: 6-12-06