

Model: DutchWest Small 2477
CFM US Corporation
62 Vermont Castings Road
Bethel, VT 05032

Certification Test Report

CFM US Corporation

Freestanding Wood Stove

Model: DutchWest Small 2477

Prepared for: CFM US Corporation
62 Vermont Castings Road
Bethel, VT 05032

Prepared by: OMNI-Test Laboratories, Inc.
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Test Period: June 8, 2004 through June 11, 2004

Report Date: July 2004

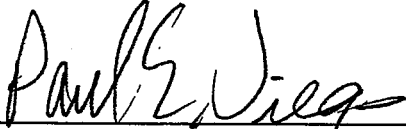
Project Number: 259-S-04-3

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AUTHORIZED SIGNATORIES

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



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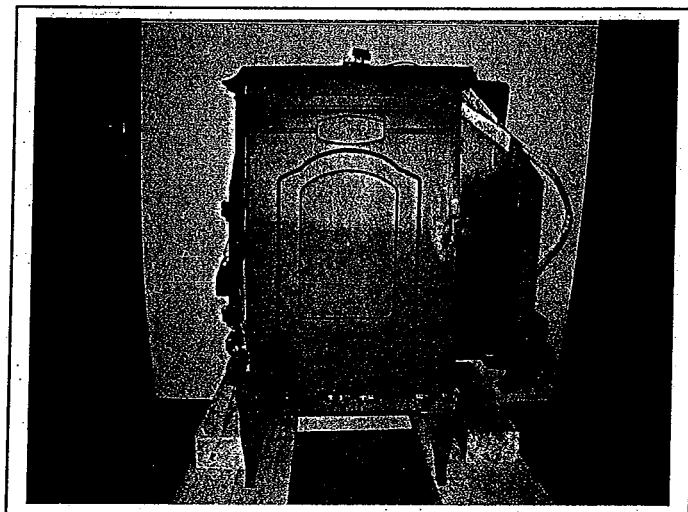
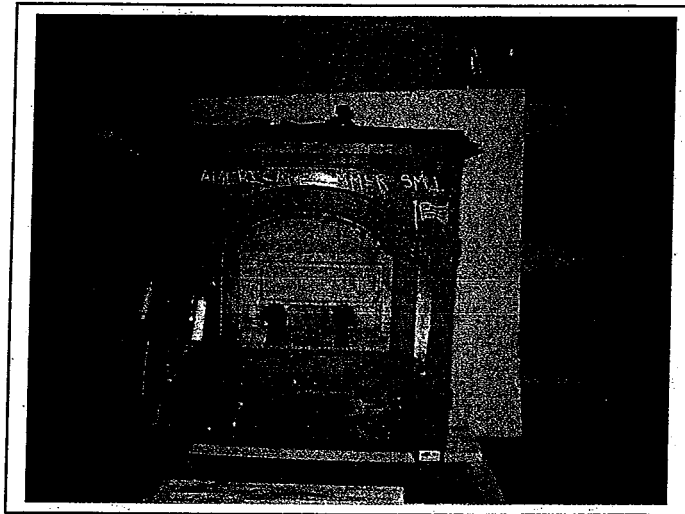


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Section 1

Sampling Procedures and Test Results

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Table 1.1 – Particulate Emissions

Run	Burn Rate (kg/hr dry)	Method 5G Emissions (g/hr)
1	0.64	2.40
3	1.21	0.75
4	1.18	0.84
5	1.47	0.60
6	1.37	1.68
7	2.08	1.37

Weighted particulate emission average of 6 test runs: 1.41 grams per hour.

Table 1.2 – Test Facility Conditions

Run	Room Temperature (°F)		Barometric Pressure (in Hg)		Air Velocity (ft/min)	
	Before	After	Before	After	Before	After
1	77	82	29.75	29.60	<50	<50
3	78	76	29.59	29.50	<50	<50
4	79	79	29.57	29.55	<50	<50
5	77	82	29.55	29.51	<50	<50
6	78	78	29.58	29.58	<50	<50
7	75	78	29.58	29.58	<50	<50

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Table 1.3.1 – Fuel Measurement and Crib Description Summary – PRETEST

Run	Pretest Fuel Weight (Starting weight)	Pretest Moisture (Dry basis - %)	Coal Bed Weight (lb)
1	5.4	19.4	2.7
3	5.5	19.5	2.5
4	6.5	19.5	2.6
5	6.5	19.8	2.6
6	11.0	19.3	2.6
7	11.0	19.0	2.5

Table 1.3.2 – Fuel Measurement and Crib Description Summary – TEST

Run	Test Fuel Wet Basis (lb)	Firebox Volume (ft ³)	Fuel Loading Density Wet Basis (lb/ft ³)	Fuel Moisture Content Dry (%)	Piece Length (in)	2x4s Used	4x4s Used
1	10.8	1.6	6.75	20.1	16	3	1
3	10.1	1.6	6.31	20.0	16	3	1
4	10.4	1.6	6.50	19.7	16	3	1
5	10.4	1.6	6.50	20.0	16	3	1
6	10.5	1.6	6.56	22.5	16	3	1
7	10.1	1.6	6.31	20.0	16	3	1

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Table 1.4 – Dilution Tunnel Gas Measurements and Sampling Data Summary

Run	Length of Test (min)	Average Dilution Tunnel Gas Measurements		
		Velocity (ft/sec)	Flow Rate (dscf/min)	Temp (°F)
1	380	13.8	142.1	90
3	190	13.9	140.8	97
4	200	14.1	143.3	97
5	160	14.0	140.5	103
6	170	14.7	147.2	104
7	110	14.5	144.5	109

Table 1.5 - Heater Operation Data (Average Temperature Data)

Run	Beginning Surface Temp Average ^a	Ending Surface Temp Average ^a	Surface Delta T ^b
1	295.4	180.6	115
3	353.2	277.0	76
4	306.4	256.0	50
5	376.2	290.2	86
6	357.2	275.8	81
7	316.6	320.4	4

a. All temperatures are in degrees F.
 b. Surface Delta T represents the difference between beginning and ending average surface temperature.

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Table 1.6 – Pretest Configuration

Run	Combustion Air	Fuel Added	Fuel Removed	Time (min)
1	Open 5 degrees	5.4 lbs. at start; no addition; coal bed 2.7 lbs.	None	75
3	Open 10 degrees	5.5 lbs. at start; no addition; coal bed 2.5 lbs.	None	60
4	Open 12 degrees	6.5 lbs. at start; no addition; coal bed 2.6 lbs.	None	70
5	Open 20 degrees	6.5 lbs. at start; no addition; coal bed 2.6 lbs.	None	60
6	Fully open – 80 degrees	11.0 lbs. at start; no addition; coal bed 2.6 lbs.	None	70
7	Fully open – 80 degrees	11.0 lbs. at start; no addition; coal bed 2.5 lbs.	None	80

Table 1.7 – Run Data

Run	Average Dry Burn Rate (kg/hr)	Initial (Induced) Draft (in H ₂ O)	Primary Air Setting (in)	Run Time (min)	Average Draft (in H ₂ O)
1	0.64	0	Open 5 degrees	380	0.036
3	1.21	0	Open 10 degrees	190	0.055
4	1.18	0	Open 12 degrees	200	0.052
5	1.47	0	Open 20 degrees	160	0.060
6	1.37	0	Fully open – 80 degrees	170	-0.027
7	2.08	0	Fully open – 80 degrees	110	0.065

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Table 1.8 – Test Configuration

Run	Five-Minute Startup	Combustion Air
1	<u>Bypass:</u> N/A. <u>Fuel Loading:</u> Loaded by 48 seconds. <u>Door:</u> Closed by 55 seconds. <u>Primary Air:</u> Not used for startup, fuel loaded and door closed without primary air assistance. <u>Other:</u> N/A. <u>Secondary:</u> Fixed. <u>Tertiary:</u> None. <u>Fan:</u> Fan on high	Open 5 degrees
3	<u>Bypass:</u> N/A. <u>Fuel Loading:</u> Loaded by 45 seconds. <u>Door:</u> Closed by 55 seconds. <u>Primary Air:</u> Not used for startup, fuel loaded and door closed without primary air assistance. <u>Other:</u> N/A. <u>Secondary:</u> Fixed. <u>Tertiary:</u> None. <u>Fan:</u> Fan on high	Open 10 degrees
4	<u>Bypass:</u> N/A. <u>Fuel Loading:</u> Loaded by 49 seconds. <u>Door:</u> Closed by 65 seconds. <u>Primary Air:</u> Not used for startup, fuel loaded and door closed without primary air assistance. <u>Other:</u> N/A. <u>Secondary:</u> Fixed. <u>Tertiary:</u> None. <u>Fan:</u> Fan on high	Open 12 degrees
5	<u>Bypass:</u> N/A. <u>Fuel Loading:</u> Loaded by 45 seconds. <u>Door:</u> Closed by 60 seconds. <u>Primary Air:</u> Not used for startup, fuel loaded and door closed without primary air assistance. <u>Other:</u> N/A. <u>Secondary:</u> Fixed. <u>Tertiary:</u> None. <u>Fan:</u> Fan on high	Open 20 degrees
6	<u>Bypass:</u> N/A. <u>Fuel Loading:</u> Loaded by 45 seconds. <u>Door:</u> Closed by 53 seconds. <u>Primary Air:</u> Not used for startup, fuel loaded and door closed without primary air assistance. <u>Other:</u> N/A. <u>Secondary:</u> Fixed. <u>Tertiary:</u> None. <u>Fan:</u> Fan on high	Fully open – 80 degrees

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7	<u>Bypass:</u> N/A. <u>Fuel Loading:</u> Loaded by 48 seconds. <u>Door:</u> Closed by 54 seconds. <u>Primary Air:</u> Not used for startup, fuel loaded and door closed without primary air assistance. <u>Other:</u> N/A. <u>Secondary:</u> Fixed. <u>Tertiary:</u> None. <u>Fan:</u> Fan on high	Fully open – 80 degrees
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TEST RESULTS AND DISCUSSION

A total of six test runs were conducted in the following categories: one in the <0.80 kg/hr dry category, two in the 0.80 to 1.25 kg/hr dry category; two in the 1.26 to 1.90 kg/hr dry category; and one at maximum.

The weighted particulate emission level was measured to be 1.41 grams per hour.

The proportionality results for all six test runs were acceptable. Quality check results for each test run are presented Section 2 of this report.

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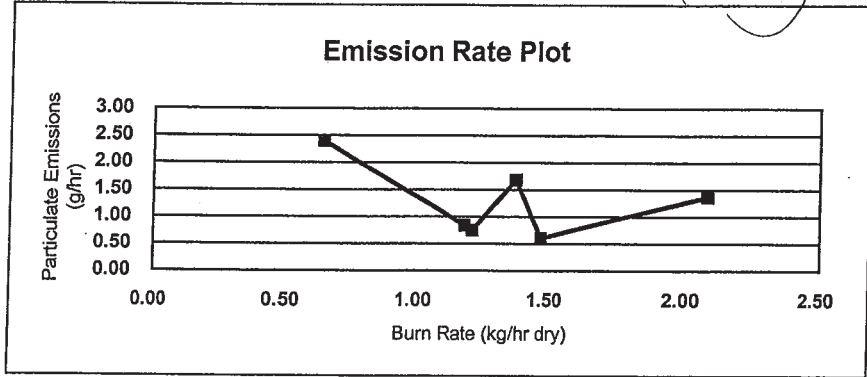
Section 2

Test Data by Run

EPA Weighted Average Emissions EPA Method 28

Client: CFM Vermont Castings Status: FINAL
 Stove Model: Dutch West Small 2477 Stove Type: Non-Catalytic Stove
 Test Dates: 6/08/04 - 6/11/04
 Project Number: 259-S-04-3
 Tracking Number: 628
 Signature/Date: _____

**Weighted Average
(g/hr)
1.41**



<table border="0" style="width: 100%;"> <tr> <td style="width: 30%;">Run #</td> <td style="width: 20%;">1</td> <td style="width: 20%;"></td> <td style="width: 30%;"></td> </tr> <tr> <td>Burn Rate (dry kg/hr)</td> <td>0.64</td> <td></td> <td></td> </tr> <tr> <td>Catagory</td> <td>1</td> <td></td> <td></td> </tr> <tr> <td>Overall Efficiency (%)</td> <td>63%</td> <td></td> <td></td> </tr> <tr> <td>Emissions (g/hr)</td> <td>2.4</td> <td></td> <td></td> </tr> <tr> <td>Cap (g/hr)</td> <td>15</td> <td></td> <td></td> </tr> <tr> <td>Weighting Factor</td> <td>0.526</td> <td>29.12%</td> <td></td> </tr> <tr> <td>Heat Output (BTU/hr)</td> <td>7733</td> <td></td> <td></td> </tr> </table>	Run #	1			Burn Rate (dry kg/hr)	0.64			Catagory	1			Overall Efficiency (%)	63%			Emissions (g/hr)	2.4			Cap (g/hr)	15			Weighting Factor	0.526	29.12%		Heat Output (BTU/hr)	7733			<table border="0" style="width: 100%;"> <tr> <td style="width: 30%;">Run #</td> <td style="width: 20%;">5</td> <td style="width: 20%;"></td> <td style="width: 30%;"></td> </tr> <tr> <td>Burn Rate (dry kg/hr)</td> <td>1.47</td> <td></td> <td></td> </tr> <tr> <td>Catagory</td> <td>3</td> <td></td> <td></td> </tr> <tr> <td>Overall Efficiency (%)</td> <td>63%</td> <td></td> <td></td> </tr> <tr> <td>Emissions (g/hr)</td> <td>0.6</td> <td></td> <td></td> </tr> <tr> <td>Cap (g/hr)</td> <td>15</td> <td></td> <td></td> </tr> <tr> <td>Weighting Factor</td> <td>0.253</td> <td>13.99%</td> <td></td> </tr> <tr> <td>Heat Output (BTU/hr)</td> <td>17763</td> <td></td> <td></td> </tr> </table>	Run #	5			Burn Rate (dry kg/hr)	1.47			Catagory	3			Overall Efficiency (%)	63%			Emissions (g/hr)	0.6			Cap (g/hr)	15			Weighting Factor	0.253	13.99%		Heat Output (BTU/hr)	17763		
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Run 1

Wood Heater Test Data - EPA Method 5G

Manufacturer: CFM Majestic
 Model: Small Dutch West
 Project No.: 259-S-4-03
 Tracking No.: 642
 Run: 1
 Test Date: 06/08/04

Burn Rate	0.64 kg/hr dry
Average Tunnel Temperature	90 degrees Fahrenheit
Average Gas Velocity in Dilution Tunnel - vs	13.8 feet/second
Average Gas Flow Rate in Dilution Tunnel - Qsd	8525.1 dscf/hour
Average Delta p	0.041 inches H2O
Average Delta H	0.70 inches H2O
Total Time of Test	380 minutes

	AVERAGE	SAMPLE TRAIN 1	SAMPLE TRAIN 2
Total Sample Volume - Vm	139.25 cubic feet	138.86 cubic feet	139.64 cubic feet
Average Gas Meter Temperature	79 degrees Fahrenheit	79 degrees Fahrenheit	79 degrees Fahrenheit
Total Sample Volume (Standard Conditions) - Vmstd	135.8 dscf	135.6 dscf	136.0 dscf
Total Particulates - mn		21.9 mg	22.5 mg
Particulate Concentration (dry-standard)	0.00016 grams/dscf	0.00016 grams/dscf	0.00017 grams/dscf
Particulate Emission Rate	1.39 grams/hour	1.38 grams/hour	1.41 grams/hour
Adjusted Emissions	2.40 grams/hour	2.37 grams/hour	2.42 grams/hour
Difference from Average		0.02 grams/hour	0.02 grams/hour
7.5% of the average emission rate	0.18		
Weighted Average Emission Rate Limit	4.10 grams/hour		
7.5% of the weighted average emission rate limit	0.31		
Results Are Acceptable			

Final Laboratory Report - Method 5G Dilution Tunnel Particulate Calculations

Client Name: CFM Vermont Casting Equipment Numbers: Train 1 Run #: 1
 Model: DutchWest Small _____ Date: 06/08/04
 Project No.: 259-S-04-3 _____
 Tracking No.: _____ 642 _____

Sample Component	Reagent	Filter # or Volume, ml	Weights			
			Final, mg	Tare, mg	Blank, mg/ml	Particulate, mg
A. Front filter catch	Filter	D007	128.6	108.9		19.7
B. Rear filter catch	Filter	D006	106.6	105.6		1.0
C. Rinse of probe and filter assembly	Acetone	A	77219.8	77218.6	0.0000	1.2

Total Particulate, mg :	21.9
-------------------------	------

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

Analyst: JMW Date: 6-25-04

Final Laboratory Report - Method 5G Dilution Tunnel Particulate Calculations

Client Name: CFM Vermont Casting Equipment Numbers: Train 2 Run #: 1
 Model: DutchWest Small Date: 06/08/04
 Project No.: 259-S-04-3
 Tracking No.: 642

Sample Component	Reagent	Filter # or Volume, ml	Weights			
			Final, mg	Tare, mg	Blank, mg/ml	Particulate, mg
A. Front filter catch	Filter	D005	120.5	100.0		20.5
B. Rear filter catch	Filter	D004	103.3	102.3		1.0
C. Rinse of probe and filter assembly	Acetone	4	79072.7	79071.7	0.0000	1.0

Total Particulate, mg :	22.5
-------------------------	------

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

Analyst: JML Date: 6-25-04

STOVE TEMPERATURE TEST DATA - METHOD 5G

Client/Model: Small Dutch West Project #: 259-S-04-3 Tracking #: 682 Page 1 of
 Date: 6-8-04 Test Crew: ARS, K. Morgan Run #: 1
 OMNI Equipment ID #:

Preburn [X] Test []	Coal Bed: 0 = Range: 2.2 - 2.7										Actual: Coal Bed: 2.7	
	Fuel Weight	Delta Weight	Stack Draft	TEMPERATURES (oF)				TEMPERATURES (oF)		Flue	Not Used Catalyst	
Time	4	8	4	Top	Bottom	7Back	6 Left	Right	5	3		
0	5.4	-0.85	77	612	505	157	278	388	528			
10	4.4	-0.57	78	537	509	201	304	374	380			
20	3.7	-0.57	78	457	488	221	310	364	307			
30	3.5	-0.55	78	390	465	214	308	355	286			
40	3.3	-0.49	78	348	437	203	302	342	258			
50	3.0	-0.45	78	330	420	197	297	341	256			
60	2.9	-0.44	78	314	411	191	287	335	243			
70	2.8	-0.42	77	302	404	184	279	325	233			
75	2.7	-0.40	77	296	402	180	277	322	228			
90												
00												
10												
20												
30												
40												
50												
60												
70												
80												
90												
AVG												

5' x 20'
5' x 40'
2' x 20' Coal Bed

Technician signature: K. J. Morgan Date: 6-08-04

FUEL DATA

Client:

Model:

Project #: 259-S-4-03 Tracking #: 642

Date: 6-8-04 Test Crew: RES, K. Maggan Run #: Run #1

OMNI Equipment ID #:

FUEL LOAD PREPARED BY: K. Maggan

FUEL: DOUGLAS-FIR SPECIES, UNTREATED, AIR-DRIED, STANDARD GRADE OR BETTER, DIMENSIONAL LUMBER.

PRE-BURN FUEL

MOISTURE CONTENT (METER -- DRY BASIS)

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

Piece	Length	Readings	Type
1	<u>8</u> ft	<u>19.1</u> <u>18.9</u> <u>20.5</u>	<u>2x4</u>
2	<u>8</u> ft	<u>19.8</u> <u>18.8</u> <u>19.3</u>	<u>2x4</u>
3	ft		

Length of cut pieces: 3/06" inches

Pre-Burn Fuel Average Moisture: 19.4%

Time (clock): 8:05 Room Temperature (F): 71° Initials: RES

TEST FUEL

FUEL TYPE AND AMOUNT: 2 x 4 30.16" 4 x 4 10.16"
 CALCULATED LOAD WEIGHT: 11.2 ACTUAL LOAD WEIGHT: 6.6 (2 x 4)
4.2 (4 x 4)
 FUEL PIECE LENGTH: 16" 10.8 Total

MOISTURE CONTENT (METER -- DRY BASIS)

PIECE	READINGS	TYPE
1	<u>18.6</u> <u>20.2</u> <u>20.0</u>	<u>2x4</u> RES
2	<u>20.9</u> <u>20.4</u> <u>20.5</u>	<u>2x4</u> RES
3	<u>18.7</u> <u>19.0</u> <u>18.7</u>	<u>2x4</u> RES
4	<u>18.1</u> <u>17.5</u> <u>18.9</u>	<u>4x4</u> RES
5	<u>20.0</u> <u>19.8</u> <u>20.1</u>	<u>4x4</u>
6	<u>19.4</u> <u>20.3</u> <u>20.2</u>	<u>2x4</u>
7	<u>20.2</u> <u>22.0</u> <u>19.7</u>	<u>2x4</u>
8	<u>19.2</u> <u>19.9</u> <u>19.9</u>	<u>2x4</u>
9		
10		

OVERALL TEST FUEL LOAD MOISTURE AVERAGE: 20.06

Time (clock): 8:15 Room Temperature (F): 71 Initials: RES

Technician signature: [Signature] Date: 6/8/04

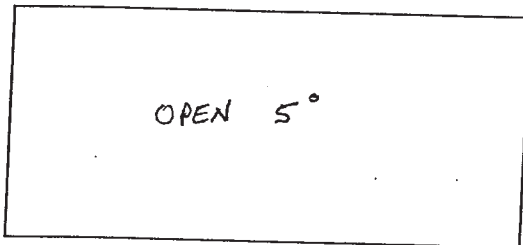
Run Notes

Client/Model: CFM
 Model: Small Dutch West
 Project #: 259-S-04-3
 Tracking Number: 642
 Run #: 211K Date: 6-08-04
 Test Crew: K. Morgan, R. Sparwasser
 OMNI Equipment ID Numbers: _____

PREBURN

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

PRIMARY:



SECONDARY: FIXED

TERTIARY: NONE

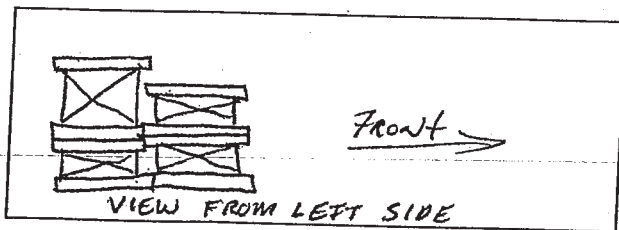
FAN: ON-High

PREBURN SETTINGS AND ACTIVITIES

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

TEST

TEST FUEL CONFIGURATION SKETCH
 (INDICATE VIEW ANGLE)

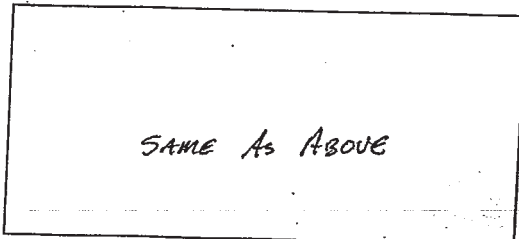


START UP PROCEDURES

BYPASS: _____
 FUEL LOADING: Loaded by 48 min-SEC AS
 DOOR: Closed by 55 min-SEC AS
 PRIMARY AIR: Not touched - Fuel loaded and door closed without use of Primary Air setting adjustment
 OTHER: _____

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

PRIMARY:



SECONDARY: FIXED

TERTIARY: NONE

FAN: ON High - not adjusted for duration of Pre-burn

Technician signature: [Signature] Date: 6-08-04

Supplemental Data EPA 5G/5H

Client: CFM

Model: Small Dutch West

Project No.: 259-S-04-3 Tracking No.: 642

Date: 6-08-04 Run No.: 1 Booth: _____

Test Crew: K. Morgan, R. Sparwasser Start Time: 11:17 Stop Time: 17:37

OMNI Equipment #'s: _____

Gas Analyzer Train Leak Check:

Stack:

Dilution Tunnel (Method 5G Only):

Initial: N/A

Initial: N/A

Final: N/A

Final: N/A

Calibrations: Span Gas CO₂: N/A O₂: N/A CO: N/A CO₂(DT): N/A

Time	N ₂ Span	N ₂ Span	N ₂ Span	N ₂ Span	N ₂ Span	N ₂ Span	N ₂ Span
O ₂			<u>N/A</u>				
CO ₂							
CO							
CO ₂ (DT)							

Stack Diameter (inches): 6.0

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

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

Induced Draft: 0 %Smoke Capture: 100

Pitot Tube Leak Test: Pre: φ @ 4.0" W.C. Post: φ @ 3.5" W.C.

Flue Pipe Cleaned Prior to First Test in Series: Date: 06-07-04 Initials: JK

	Initial	Middle	Ending
Pb (in. Hg)	<u>29.75</u>	<u>29.66</u>	<u>29.60</u>
Room Temp (°F)	<u>77</u>	<u>78</u>	<u>82</u>

Technician signature: K. J. Morgan Date: 6-08-04

Model: DutchWest Small
CFM US Corporation
62 Vermont Castings Road
Bethel, VT 05032

Run 2

Wood Heater Test Data - EPA Method 5G

Manufacturer: CFM
 Model: Small Dutch West
 Project No.: 259-S-04-3
 Tracking No.: 642
 Run: 2
 Test Date: 06/09/04

Burn Rate	1.17 kg/hr dry
Average Tunnel Temperature	100 degrees Fahrenheit
Average Gas Velocity in Dilution Tunnel - vs	13.9 feet/second
Average Gas Flow Rate in Dilution Tunnel - Qsd	8431.8 dscf/hour
Average Delta p	0.041 inches H2O
Average Delta H	0.67 inches H2O
Total Time of Test	200 minutes

	AVERAGE	SAMPLE TRAIN 1	SAMPLE TRAIN 2
Total Sample Volume - Vm	74.27 cubic feet	75.17 cubic feet	73.36 cubic feet
Average Gas Meter Temperature	81 degrees Fahrenheit	81 degrees Fahrenheit	81 degrees Fahrenheit
Total Sample Volume (Standard Conditions) - Vmstd	71.9 dscf	72.9 dscf	70.9 dscf
Total Particulates - mn		1.9 mg	2.7 mg
Particulate Concentration (dry-standard)	0.00003 grams/dscf	0.00003 grams/dscf	0.00004 grams/dscf
Particulate Emission Rate	0.27 grams/hour	0.22 grams/hour	0.32 grams/hour
Adjusted Emissions	0.61 grams/hour	0.52 grams/hour	0.71 grams/hour
Difference from Average		0.10 grams/hour	0.10 grams/hour
7.5% of the average emission rate	0.05		
Weighted Average Emission Rate Limit	4.10 grams/hour		
7.5% of the weighted average emission rate limit	0.31		

Results Are Acceptable

Wood Heater Test Data - EPA Method 5G

Run: 2
 Manufacturer: CFM
 Model: Small Dutch West
 Tracking No.: 642
 Project No.: 259-S-04-3
 Test Date: 09-Jun-04
 Beginning Clock Time: 08:41
 Recording Interval: 10 min.
 Total Sampling Time: 200 min.

Velocity Traverse Data								
	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8
Initial dP	0.036	0.046	0.044	0.038	0.036	0.046	0.044	0.036
Initial Temp.	100	102	102	103	104	104	103	102

OMNI Equipment Numbers: _____

PM Control Module: _____
 Dilution Tunnel MW(dry): 29.00 lb/lb-mole
 Dilution Tunnel MW(wet): 28.56 lb/lb-mole
 Dilution Tunnel H2O: 4.00 percent
 Dilution Tunnel Static: -0.165 "H2O
 Pitot Tube Cp: 0.99
 Meter Box Y Factor: 1.0035 (1) 1.0015 (2)
 Barometric Pressure: Begin Middle End Average
29.54 29.56 29.59 29.56 "Hg

Signature/Date: _____
 Tunnel Velocity: 13.92 ft/sec.
 Initial Tunnel Flow: 140.0 scfm
 Average Tunnel Flow: 140.5 scfm
 Tunnel Area: 0.18825 ft²
 Post-Test Leak Check: 0.01@12 cfm@"Hg
 Fuel Moisture (dry basis): 19.98 %
 Total Particulate (1): 1.9 mg
 Total Particulate (2): 2.7 mg

Elapsed Time	Particulate Sampling Data														Fuel Weight, lb		Wood Heater Temperature Data, °F										Stack	
	Gas Meter Cubic Feet (1)	Gas Meter Cubic Feet (2)	Sample Rate, cfm (1)	Sample Rate, cfm (2)	Orifice dH	Meter oF (1)	Meter oF (2)	Meter Vac. In. Hg. (1)	Meter Vac. In. Hg. (2)	Dilution Tunnel Temp.	Dilution Tunnel dP	Pro. Rate (10%) (1)	Pro. Rate (10%) (2)	Scale Reading	Weight Change	Firebox Top	Firebox Back	Firebox Right	Firebox Left	Firebox Bottom	Catalyst Exit	Average Surface	Stack	Filter	Impinger exit	Ambient	Draft In. H2O	
0	215.502	219.303			0.00	79	80	0	0	103	0.041			10.3		393	337	381	313	468		378.4	313	80		80	0.580	
10	219.315	223.010	0.38	0.37	0.70	83	82	4	4	106	0.041	102	102	9.1	-1.2	408	365	340	304	441		371.6	381	89		80	0.060	
20	222.990	226.790	0.37	0.38	0.70	83	82	4	4	107	0.041	99	104	8.0	-1.1	424	425	315	286	416		373.2	401	89		80	0.060	
30	226.750	230.210	0.38	0.34	0.70	82	82	4	4	109	0.041	101	95	6.9	-1.1	446	472	310	275	402		381.0	435	90		80	0.061	
40	230.450	233.850	0.37	0.36	0.70	82	82	4	4	108	0.041	100	101	5.8	-1.1	459	499	314	273	395		388.0	423	90		79	0.061	
50	234.190	237.580	0.37	0.37	0.70	81	82	4	4	107	0.041	101	103	4.7	-1.1	465	505	330	280	389		393.8	413	90		80	0.060	
60	237.850	241.250	0.37	0.37	0.70	81	82	4	4	106	0.041	99	101	3.8	-0.9	467	488	350	290	386		396.2	396	90		79	0.059	
70	241.605	244.930	0.38	0.37	0.70	81	82	4	4	106	0.041	101	102	3.0	-0.8	471	471	364	300	382		397.6	392	90		79	0.057	
80	245.340	248.540	0.37	0.36	0.70	81	82	4	4	103	0.041	100	99	2.6	-0.4	461	439	370	312	379		392.2	353	88		80	0.061	
90	249.150	252.220	0.38	0.37	0.70	81	82	4	4	100	0.041	102	101	2.1	-0.5	445	397	375	318	371		381.2	328	88		81	0.059	
100	252.890	255.810	0.37	0.36	0.70	81	82	4	4	99	0.041	100	98	1.8	-0.3	433	365	376	321	368		372.6	315	87		80	0.056	
110	256.730	259.580	0.38	0.38	0.70	81	82	4	4	98	0.041	103	103	1.4	-0.4	422	343	374	323	361		364.6	317	86		79	0.055	
120	260.590	263.280	0.39	0.37	0.70	81	81	4	4	98	0.041	103	102	1.1	-0.3	418	327	374	325	357		360.2	301	86		80	0.054	
130	264.390	266.950	0.38	0.37	0.70	81	81	4	4	95	0.041	101	100	1.0	-0.1	402	312	370	322	350		351.2	287	85		80	0.051	
140	267.990	270.510	0.36	0.36	0.70	80	81	4	4	95	0.041	96	97	0.8	-0.2	389	301	368	321	349		345.6	284	85		78	0.050	
150	271.800	274.100	0.38	0.36	0.70	80	81	4	4	95	0.041	102	98	0.6	-0.2	381	290	369	319	347		341.2	276	84		79	0.050	
160	275.620	277.800	0.38	0.37	0.70	81	81	4	4	93	0.041	102	101	0.5	-0.1	373	279	367	316	346		336.2	269	84		79	0.048	
170	279.500	281.500	0.39	0.37	0.70	81	81	4	4	93	0.041	103	101	0.3	-0.2	365	270	361	313	347		331.2	261	84		79	0.048	
180	283.270	285.200	0.38	0.37	0.70	81	81	4	4	93	0.041	100	101	0.1	-0.2	357	262	355	309	348		326.2	255	84		79	0.047	
190	286.970	288.900	0.37	0.37	0.70	81	81	4	4	93	0.041	99	101	0.1	0	349	256	351	307	348		322.2	253	84		80	0.045	
200	290.671	292.666	0.37	0.38	0.70	80	81	4	4	93	0.041	99	103	0.0	-0.1	345	253	346	305	346		319.0	249	84		79	0.045	
Avg/Total	75.169	73.363	0.38	0.37	0.67	81.05	81.48			99.98	0.041	100.73	100.74									59		86.52	#DIV/0!		0.079	

7/11/04 7:25

Final Laboratory Report - Method 5G Dilution Tunnel Particulate Calculations

Client Name: CFM Vermont Casting Equipment Numbers: Train 1 Run #: 2
 Model: DutchWest Small _____ Date: 06/09/04
 Project No.: 259-S-04-3 _____
 Tracking No.: 642 _____

Sample Component	Reagent	Filter # or Volume, ml	Weights			
			Final, mg	Tare, mg	Blank, mg/ml	Particulate, mg
A. Front filter catch	Filter	D003	115.3	113.5		1.8
B. Rear filter catch	Filter	D002	108.0	108.0		0.0
C. Rinse of probe and filter assembly	Acetone	E	76266.6	76266.5	0.0000	0.1

Total Particulate, mg :	1.9
-------------------------	-----

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

Analyst: JAW Date: 6-25-04

7-15 of 215

Final Laboratory Report - Method 5G Dilution Tunnel Particulate Calculations

Client Name: CFM Vermont Casting Equipment Numbers: Train 2 Run #: 2
 Model: DutchWest Small Project No.: 259-S-04-3 Date: 06/09/04
 Tracking No.: 642

Sample Component	Reagent	Filter # or Volume, ml	Weights			
			Final, mg	Tare, mg	Blank, mg/ml	Particulate, mg
A. Front filter catch	Filter	D001	100.4	98.6		1.8
B. Rear filter catch	Filter	D000	99.9	99.5		0.4
C. Rinse of probe and filter assembly	Acetone	5	80664.3	80663.8	0.0000	0.5

Total Particulate, mg :	2.7
-------------------------	-----

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	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg

Analyst: JMV Date: 6-25-04

7-11-04 of 2-15

STOVE TEMPERATURE TEST DATA - METHOD 5G

Client/Model: CFM Sm. Dutch West Project #: 259-S-04-3 Tracking #: 642 Page of
 Date: 6-09-04 Test Crew: K. Morgan, R. Spawasser Run #: 2 Fan Con Firmation:
 OMNI Equipment ID #:

Time	Fuel Weight	Delta Weight	Stack Draft	Coal Bed: 0 =								Actual: 2:3										
				TEMPERATURES (oF)																		
0	10	20	30	40	50	60	65-70	80	90	00	10	20	30	40	50	60	70	80	90	AVG	Not Used	
	5.5		.083	74	777	518	214	214	220	447	3	Flue	595									
	4.6	1.1	.068	76	574	521	261	261	256	436	382											
	4.2	0.4	.060	78	496	507	291	291	279	413	341											
	3.5	0.7	.065	80	467	484	318	318	295	400	376											
	3.0	0.5	.065	79	441	475	339	339	301	386	345											
	2.7	0.3	.060	81	426	477	346	346	306	385	337											
	2.4	0.3	.056	79	400	471	342	342	310	383	312											
	2.3	0.1	.058	80	393	468	337	337	313	381	313											

STIR @ 20
 STIR @ 40

Technician signature: K. Morgan Date: 6-09-04

FUEL DATA

Client: Vermont Castings *CFM*
 Model: Dutch West Large *Dutch West Small*
 Project #: 259-S-03-3 Tracking #: 628 *642* *1K*
 Date: 6-09-04 Test Crew: K. Morgan, R. Sparwasser Run #: 2
 OMNI Equipment ID #: _____
 FUEL LOAD PREPARED BY: K. Morgan
 FUEL: DOUGLAS-FIR SPECIES, UNTREATED, AIR-DRIED, STANDARD GRADE OR BETTER, DIMENSIONAL LUMBER.

PRE-BURN FUEL					
MOISTURE CONTENT (METER -- DRY BASIS)					
CALIBRATION:	Cal Value (1) = 12%	Actual Reading	<u>12.0</u>		
	Cal Value (2) = 22%	Actual Reading	<u>22.0</u>		
Piece	Length	Readings			Type
1	<u>8</u> ft	<u>19.2</u>	<u>19.3</u>	<u>22.1</u>	<u>2x4</u>
2	<u>8</u> ft	<u>20.9</u>	<u>19.7</u>	<u>20.5</u>	<u>2x4</u>
3	_____ ft	_____	_____	_____	_____
Length of cut pieces: <u>31@6"</u> inches		Pre-Burn Fuel Average Moisture: <u>20.28%</u>			
Time (clock): <u>06:00</u>		Room Temperature (F): <u>70</u>	Initials: <u>1K</u>		

TEST FUEL					
FUEL TYPE AND AMOUNT:	2 x 4	<u>3</u>	4 x 4	<u>1</u>	
CALCULATED LOAD WEIGHT:	<u>11.2</u>		ACTUAL LOAD WEIGHT:	<u>6.0</u>	(2 x 4)
				<u>4.3</u>	(4 x 4)
FUEL PIECE LENGTH:	<u>16.0"</u>			<u>10.3</u>	Total
MOISTURE CONTENT (METER -- DRY BASIS)					
PIECE	READINGS			TYPE	
1	<u>20.1</u>	<u>19.1</u>	<u>19.9</u>	<u>4x4</u>	
2	<u>21.6</u>	<u>20.8</u>	<u>20.1</u>	<u>2x4</u>	
3	<u>19.9</u>	<u>19.0</u>	<u>19.5</u>	<u>2x4</u>	
4	<u>20.3</u>	<u>19.8</u>	<u>19.7</u>	<u>2x4</u>	
5	_____	_____	_____	_____	
6	_____	_____	_____	_____	
7	_____	_____	_____	_____	
8	_____	_____	_____	_____	
9	_____	_____	_____	_____	
10	_____	_____	_____	_____	
OVERALL TEST FUEL LOAD MOISTURE AVERAGE:				<u>19.98</u>	
Time (clock): <u>06:10</u>		Room Temperature (F): <u>70</u>		Initials: <u>1K</u>	

Technician signature: *K. Morgan* Date: 6-09-04

Run Notes

Client/Model: Vermont Castings

Model: Dutch West Large ^{SMALL DUTCH WEST}

Project #: 259-S-03-3 ^{259-S-04-3}

Tracking Number: 628 642

Run #: 2 Date: 6-09-04

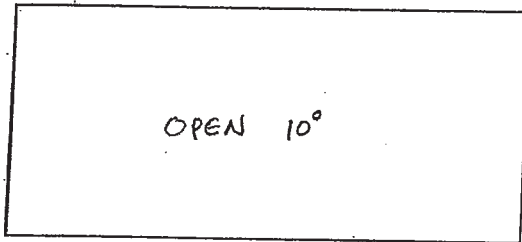
Test Crew: K. Morgan, R. Sparwasser

OMNI Equipment ID Numbers: _____

PREBURN

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

PRIMARY:



SECONDARY: FIXED

TERTIARY: NONE

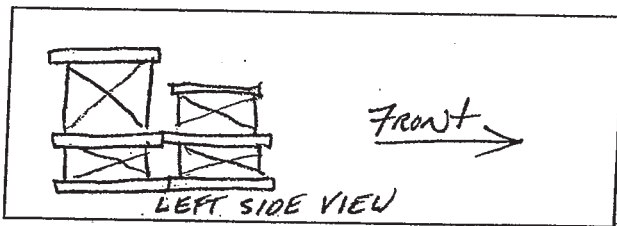
FAN: OFF DURATION OF...
(FAN-CONFIRMATION)

PREBURN SETTINGS AND ACTIVITIES

TIME	AIR (THERMO) CHANGES PRIMARY/SECONDARY/TERTIARY	FAN SETTING CHANGE	ADD FUEL + WT.	ADD FUEL - WT.	RAKE COAL	COMMENT
0	<u>TEST setting</u>					
20					X	<u>STIR</u>
40					X	<u>STIR</u>
65					X	<u>LEVEL</u>

TEST

TEST FUEL CONFIGURATION SKETCH
(INDICATE VIEW ANGLE)

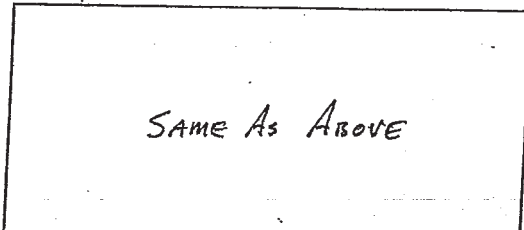


START UP PROCEDURES

BYPASS: NOT USED
 FUEL LOADING: Loaded by 55 sec
 DOOR: Closed by 75 sec.
 PRIMARY AIR: Not Used for Start-up,
Fuel simply loaded and
Door Closed without
 OTHER: Primary Air Assistance.

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

PRIMARY:



SECONDARY: FIXED

TERTIARY: NONE

FAN: OFF For Duration of
test - FAN CONFIRM.

Technician signature: K. Morgan Date: 6-09-04

Supplemental Data EPA 5G/5H

Client: Vermont Castings *CFTM*

Model: Dutch West ~~Large~~ *SMALL*

Project No.: ~~259 S-03-3~~ Tracking No.: 642 *628*

Date: 259-5-04-3 *6-09-04* Run No.: 2 Booth: _____

Test Crew: B. Davis *K. R. SPARWASSER* *K. Morgan* Start Time: 08:41 Stop Time: 12:01

OMNI Equipment #'s: _____

Gas Analyzer Train Leak Check:

Stack:

Dilution Tunnel (Method 5G Only):

Initial: N/A

Initial: N/A

Final: N/A

Final: N/A

Calibrations: Span Gas CO₂: N/A O₂: N/A CO: N/A CO₂(DT): N/A

Time	N ₂ Span	N ₂ Span	N ₂ Span	N ₂ Span	N ₂ Span	N ₂ Span	N ₂ Span
O ₂							
CO ₂							
CO							
CO ₂ (DT)							

Stack Diameter (inches): 6.0

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

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

Induced Draft: ∅ %Smoke Capture: 100

Pitot Tube Leak Test: Pre: ∅ @ 3.5" W.C. Post: ∅ @ 4.2" W.C.

Flue Pipe Cleaned Prior to First Test in Series: Date: 6-07-04 Initials: K

	Initial	Middle	Ending
Pb (in. Hg)	<u>29.54</u>	<u>29.56</u>	<u>29.59</u>
Room Temp (°F)	<u>80</u>	<u>80</u>	<u>79</u>

Technician signature: K. F. Morgan Date: 6-09-04

Model: DutchWest Small
CFM US Corporation
62 Vermont Castings Road
Bethel, VT 05032

Run 3

Wood Heater Test Data - EPA Method 5G

Manufacturer: CFM
 Model: Small Dutch West
 Project No.: 259-S-04-3
 Tracking No.: 642
 Run: 3
 Test Date: 06/09/04

Burn Rate	1.21 kg/hr dry
Average Tunnel Temperature	97 degrees Fahrenheit
Average Gas Velocity in Dilution Tunnel - vs	13.9 feet/second
Average Gas Flow Rate in Dilution Tunnel - Qsd	8448.6 dscf/hour
Average Delta p	0.041 inches H2O
Average Delta H	0.67 inches H2O
Total Time of Test	190 minutes

	AVERAGE	SAMPLE TRAIN 1	SAMPLE TRAIN 2
Total Sample Volume - Vm	71.35 cubic feet	71.54 cubic feet	71.15 cubic feet
Average Gas Meter Temperature	80 degrees Fahrenheit	79 degrees Fahrenheit	80 degrees Fahrenheit
Total Sample Volume (Standard Conditions) - Vmstd	69.2 dscf	69.5 dscf	68.9 dscf
Total Particulates - mn		2.6 mg	3 mg
Particulate Concentration (dry-standard)	0.00004 grams/dscf	0.00004 grams/dscf	0.00004 grams/dscf
Particulate Emission Rate	0.34 grams/hour	0.32 grams/hour	0.37 grams/hour
Adjusted Emissions	0.75 grams/hour	0.70 grams/hour	0.79 grams/hour
Difference from Average		0.05 grams/hour	0.05 grams/hour
7.5% of the average emission rate	0.06		
Weighted Average Emission Rate Limit	4.10 grams/hour		
7.5% of the weighted average emission rate limit	0.31		
Results Are Acceptable			

Wood Heater Test Data - EPA Method 5G

Run: 3
 Manufacturer: CFM
 Model: Small Dutch West
 Tracking No.: 642
 Project No.: 259-S-04-3
 Test Date: 09-Jun-04
 Beginning Clock Time: 14:15
 Recording Interval: 10 min.
 Total Sampling Time: 190 min.

Velocity Traverse Data								
	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8
Initial dP	0.034	0.044	0.046	0.038	0.034	0.044	0.044	0.042
Initial Temp.	97	97	97	97	97	97	97	97

OMNI Equipment Numbers: _____

PM Control Module: _____
 Dilution Tunnel MW(dry): 29.00 lb/lb-mole
 Dilution Tunnel MW(wet): 28.56 lb/lb-mole
 Dilution Tunnel H2O: 4.00 percent
 Dilution Tunnel Static: -0.150 "H2O
 Pitot Tube Cp: 0.99
 Meter Box Y Factor: 1.0035 (1) 1.0015 (2)
 Barometric Pressure: Begin Middle End Average
29.59 29.55 29.5 29.55 "Hg

Signature/Date: _____
 Tunnel Velocity: 13.89 ft/sec.
 Initial Tunnel Flow: 140.6 scfm
 Average Tunnel Flow: 140.8 scfm
 Tunnel Area: 0.18825 ft²
 Post-Test Leak Check: 0.08@16 cfm@"Hg
 Fuel Moisture (dry basis): 19.5 %
 Total Particulate (1): 2.6 mg
 Total Particulate (2): 3.0 mg

Elapsed Time	Particulate Sampling Data														Fuel Weight, lb		Wood Heater Temperature Data, oF											Stack	
	Gas Meter Cubic Feet (1)	Gas Meter Cubic Feet (2)	Sample Rate, cfm (1)	Sample Rate, cfm (2)	Orifice dH	Meter oF (1)	Meter oF (2)	Meter Vac. In. Hg. (1)	Meter Vac. In. Hg. (2)	Dilution Tunnel Temp.	Dilution Tunnel dP	Pro. Rate (10%) (1)	Pro. Rate (10%) (2)	Scale Reading	Weight Change	Firebox Top	Firebox Right	Firebox Left	Firebox Back	Firebox Bottom	Catalyst Exit	Average Surface	Stack	Filter	Impinger exit	Ambient	Draft In. H2O		
0	291.102	293.197			0.00	78	79	0	0	97	0.041			10.1		369	376	324	223	474		353.2	274	78		78	0.050		
10	294.852	296.927	0.38	0.37	0.70	80	80	4	4	102	0.041	101	101	9.1	-1	365	337	311	236	449		339.6	358	87		79	0.065		
20	298.602	300.657	0.38	0.37	0.70	80	80	4	4	105	0.041	101	101	8.0	-1.1	377	305	289	283	420		334.8	394	79		79	0.070		
30	302.352	304.387	0.38	0.37	0.70	80	80	4	4	107	0.041	101	101	6.7	-1.3	401	299	276	316	398		338.0	421	88		78	0.073		
40	306.102	308.117	0.38	0.37	0.70	80	80	4	4	108	0.041	101	101	5.5	-1.2	424	305	272	335	386		344.4	423	89		78	0.073		
50	309.852	311.847	0.38	0.37	0.70	80	81	4	4	106	0.041	101	101	4.4	-1.1	425	316	275	334	374		344.8	400	88		78	0.070		
60	313.602	315.577	0.38	0.37	0.70	80	81	4	4	105	0.041	101	101	3.7	-0.7	417	331	281	317	368		342.8	374	88		78	0.068		
70	317.352	319.307	0.38	0.37	0.70	80	81	4	4	102	0.041	101	101	2.9	-0.8	412	346	290	295	361		340.8	354	87		78	0.063		
80	321.102	323.037	0.38	0.37	0.70	80	81	4	4	100	0.041	100	100	2.4	-0.5	401	351	292	256	359		331.8	322	86		78	0.058		
90	324.852	326.767	0.38	0.37	0.70	80	81	4	4	97	0.041	100	100	2.1	-0.3	386	353	297	247	353		327.2	302	86		78	0.055		
100	328.602	330.497	0.38	0.37	0.70	80	81	4	4	96	0.041	100	100	1.8	-0.3	371	351	297	226	349		318.8	287	85		78	0.051		
110	332.360	334.250	0.38	0.38	0.70	79	80	4	4	95	0.041	100	101	1.5	-0.3	358	348	297	211	346		312.0	277	84		77	0.050		
120	336.130	338.000	0.38	0.38	0.70	79	80	4	4	95	0.041	101	101	1.2	-0.3	349	342	301	200	339		306.2	284	83		79	0.050		
130	339.940	341.740	0.38	0.37	0.70	79	80	4	4	93	0.041	102	100	1.0	-0.2	345	336	301	198	333		302.6	272	83		77	0.048		
140	343.740	345.530	0.38	0.38	0.70	79	80	4	4	92	0.041	101	102	0.8	-0.2	334	332	303	190	330		297.8	254	82		79	0.045		
150	347.500	349.280	0.38	0.38	0.70	79	80	4	4	91	0.041	100	100	0.6	-0.2	322	326	302	182	326		291.6	245	82		78	0.045		
160	351.260	353.030	0.38	0.38	0.70	79	80	4	4	90	0.041	100	100	0.5	-0.1	312	324	298	174	321		285.8	244	81		79	0.045		
170	355.040	356.780	0.38	0.38	0.70	78	79	4	4	90	0.041	101	100	0.3	-0.2	306	326	293	171	322		283.6	240	81		78	0.043		
180	358.820	360.550	0.38	0.38	0.70	78	79	4	4	90	0.041	101	101	0.1	-0.2	299	329	285	167	321		280.2	230	81		78	0.040		
190	362.643	364.346	0.38	0.38	0.70	78	79	4	4	88	0.041	102	101	0.0	-0.1	295	327	281	164	318		277.0	224	81		76	0.040		
Avg/Total	71.541	71.149	0.38	0.37	0.67	79.30	80.10			97.45	0.041	100.75	100.75									76		83.95	#DIV/0!		0.055		

Final Laboratory Report - Method 5G Dilution Tunnel Particulate Calculations

Client Name: CFM Vermont Casting Equipment Numbers: Train 1 Run #: 3
 Model: DutchWest Small _____ Date: 06/09/04
 Project No.: 259-S-04-3 _____
 Tracking No.: 642 _____

Sample Component	Reagent	Filter # or Volume, ml	Weights			
			Final, mg	Tare, mg	Blank, mg/ml	Particulate, mg
A. Front filter catch	Filter	C995	113.0	111.5		1.5
B. Rear filter catch	Filter	C994	108.2	108.1		0.1
C. Rinse of probe and filter assembly	Acetone	1	79178.0	79177.0	0.0000	1.0

Total Particulate, mg :	2.6
-------------------------	-----

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

Analyst: JMW Date: 6-25-04

Final Laboratory Report - Method 5G Dilution Tunnel Particulate Calculations

Client Name: CFM Vermont Casting Equipment Numbers: Train 2 Run #: 3
 Model: DutchWest Small Date: 06/09/04
 Project No.: 259-S-04-3
 Tracking No.: 642

Sample Component	Reagent	Filter # or Volume, ml	Weights			
			Final, mg	Tare, mg	Blank, mg/ml	Particulate, mg
A. Front filter catch	Filter	C993	102.8	100.7		2.1
B. Rear filter catch	Filter	C992	99.2	99.0		0.2
C. Rinse of probe and filter assembly	Acetone	D	76865.3	76864.6	0.0000	0.7

Total Particulate, mg :	3.0
-------------------------	-----

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

Analyst: JAL

Date: 6-25-04

2-25-04 2-1-5

STOVE TEMPERATURE TEST DATA - METHOD 5G

Client/Model: CFM Small Dutch West Project #: 259-5-04-3 Tracking #: 642 Page of
 Date: 6-09-04 Test Crew: K. Meyer, R. Sparwasser Run #: 3
 OMNI Equipment ID #:

Preburn Test	Time	Fuel Weight	Delta Weight	Stack Draft	TEMPERATURES (oF)								Actual: Coal Bed: <u>2.5</u>
					Ambient	Top 4	Bottom	Back 7	Left 6	Right 5	Flue 3	Gatayst	
<input checked="" type="checkbox"/>	0	5.5		.088	78	733	513	188	330	421	507	Not Used	
<input type="checkbox"/>	10	4.5	1.0	.070	79	402	538	231	346	417	402		
	20	3.7	0.6	.063	78	489	532	256	346	396	335		
	30	3.3	0.6	.063	79	456	520	256	344	398	349		
	40	3.0	0.3	.058	79	418	502	250	339	388	312		
	50	2.4	0.4	.055	78	392	489	239	382	382	293		
	60	2.5	0.1	.05	78	369	474	223	324	376	274		
	70												
	80												
	90												
	00												
	10												
	20												
	30												
	40												
	50												
	60												
	70												
	80												
	90												
	AVG												

str @ 20
str @ 40

Technician signature: K. P. Meyer Date: 6-09-04

2-210 of 7-65

FUEL DATA

Client: CFM

Model: Sm. Dutch West

Project #: 259-S-04-3 Tracking #: 642

Date: 6-09-04 Test Crew: K. Morgan, R. Sparwasser Run #: 3

OMNI Equipment ID #: _____

FUEL LOAD PREPARED BY: K. Morgan

FUEL: DOUGLAS-FIR SPECIES, UNTREATED, AIR-DRIED, STANDARD GRADE OR BETTER, DIMENSIONAL LUMBER.

PRE-BURN FUEL					
MOISTURE CONTENT (METER -- DRY BASIS)					
CALIBRATION:	Cal Value (1) = 12%	Actual Reading <u>12.0</u>			
	Cal Value (2) = 22%	Actual Reading <u>22.0</u>			
Piece	Length	Readings			Type
1	<u>8</u> ft	<u>19.7</u>	<u>19.0</u>	<u>19.3</u>	<u>2x4</u>
2	<u>8</u> ft	<u>19.0</u>	<u>20.8</u>	<u>20.2</u>	<u>2x4</u>
3	_____ ft	_____	_____	_____	_____
Length of cut pieces: <u>35 @ 6</u> inches		Pre-Burn Fuel Average Moisture: <u>19.5%</u>			
Time (clock): <u>12:30</u>		Room Temperature (F): <u>76</u>	Initials: <u>KL</u>		

TEST FUEL				
FUEL TYPE AND AMOUNT:	2 x 4 <u>3</u>	4 x 4 <u>1</u>		
CALCULATED LOAD WEIGHT:	<u>11.2</u>	ACTUAL LOAD WEIGHT:	<u>6.0</u>	(2 x 4)
			<u>4.1</u>	(4 x 4)
FUEL PIECE LENGTH: <u>16.0"</u>			<u>10.1</u>	Total
MOISTURE CONTENT (METER -- DRY BASIS)				
PIECE	READINGS			TYPE
1	<u>20.4</u>	<u>21.0</u>	<u>19.8</u>	<u>2x4</u>
2	<u>18.7</u>	<u>20.6</u>	<u>21.0</u>	<u>2x4</u>
3	<u>19.9</u>	<u>18.9</u>	<u>19.0</u>	<u>2x4</u>
4	<u>20.0</u>	<u>20.2</u>	<u>18.9</u>	<u>4x4</u>
5	_____	_____	_____	_____
6	_____	_____	_____	_____
7	_____	_____	_____	_____
8	_____	_____	_____	_____
9	_____	_____	_____	_____
10	_____	_____	_____	_____
OVERALL TEST FUEL LOAD MOISTURE AVERAGE: <u>20.02</u>				
Time (clock): <u>12:35</u>		Room Temperature (F): <u>76</u>	Initials: <u>KL</u>	

Technician signature: K. Morgan Date: 6-09-04

Run Notes

Client/Model: CFM
Model: SMALL DUTCH WEST
Project #: 259-5-04-3

Tracking Number: 642

Run #: 3 Date: 6-09-04

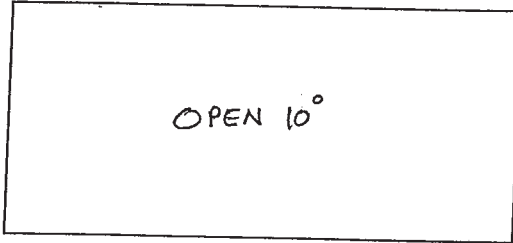
Test Crew: K. Morgan, R. Sparrwasser

OMNI Equipment ID Numbers: _____

PREBURN

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

PRIMARY:



SECONDARY: FIXED

TERTIARY: NONE

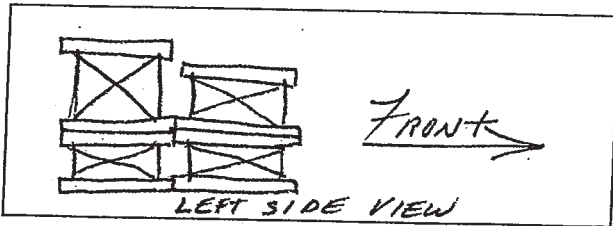
FAN: ON-High

PREBURN SETTINGS AND ACTIVITIES

TIME	AIR (THERMO) CHANGES PRIMARY/SECONDARY/TERTIARY	FAN SETTING CHANGE	ADD FUEL + WT.	ADD FUEL - WT.	RAKE COAL	COMMENT
0	<u>TEST setting</u>					
20					X	STIR
40					X	STIR
60					X	LEVEL

TEST

TEST FUEL CONFIGURATION SKETCH
(INDICATE VIEW ANGLE)

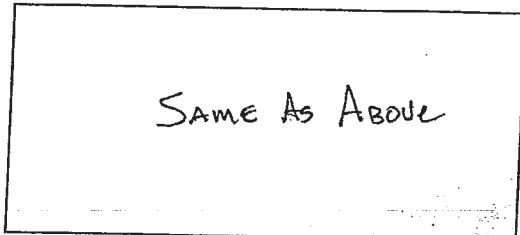


START UP PROCEDURES

BYPASS: NOT USED
FUEL LOADING: Loaded by 45 sec
DOOR: Closed by 55 sec
PRIMARY AIR: Not manipulated for START-UP.
OTHER: _____

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

PRIMARY:



SECONDARY: FIXED

TERTIARY: NONE

FAN: ON-High

Technician signature: K. Morgan

Date: 6-9-04

Supplemental Data EPA 5G/5H

Client: CFM

Model: SMALL Dutch NEST

Project No.: 259-S-04-3 Tracking No.: 642

Date: 6-09-04 Run No.: 3 Booth: _____

Test Crew: K. Morgan, R. SPARWASSER Start Time: 14:15 Stop Time: 17:25

OMNI Equipment #'s: _____

Gas Analyzer Train Leak Check:

Stack:

Dilution Tunnel (Method 5G Only):

Initial: N/A

Initial: N/A

Final: N/A

Final: N/A

Calibrations: Span Gas CO₂: N/A O₂: N/A CO: N/A CO₂(DT): N/A

Time	N ₂ Span	N ₂ Span	N ₂ Span	N ₂ Span	N ₂ Span	N ₂ Span	N ₂ Span
O ₂							
CO ₂							
CO							
CO ₂ (DT)							

Stack Diameter (inches): 6.0

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

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

Induced Draft: 0 %Smoke Capture: 100

Pitot Tube Leak Test: Pre: 0 @ 3.7" W.C. Post: 0 @ 3.5" W.C.

Flue Pipe Cleaned Prior to First Test in Series: Date: 6-07-04 Initials: K

	Initial	Middle	Ending
Pb (in. Hg)	<u>29.59</u>	<u>29.55</u>	<u>29.50</u>
Room Temp (°F)	<u>78</u>	<u>78</u>	<u>76</u>

Technician signature: K. Morgan Date: 6-09-04

Model: DutchWest Small
CFM US Corporation
62 Vermont Castings Road
Bethel, VT 05032

Run 4

Wood Heater Test Data - EPA Method 5G

Manufacturer: CFM
 Model: Small Dutch West
 Project No.: 259-S-04-3
 Tracking No.: 642
 Run: 4
 Test Date: 06/10/04

Burn Rate	1.18 kg/hr dry
Average Tunnel Temperature	97 degrees Fahrenheit
Average Gas Velocity in Dilution Tunnel - vs	14.1 feet/second
Average Gas Flow Rate in Dilution Tunnel - Qsd	8595.1 dscf/hour
Average Delta p	0.042 inches H2O
Average Delta H	0.67 inches H2O
Total Time of Test	200 minutes

	AVERAGE	SAMPLE TRAIN 1	SAMPLE TRAIN 2
Total Sample Volume - Vm	73.50 cubic feet	74.11 cubic feet	72.89 cubic feet
Average Gas Meter Temperature	80 degrees Fahrenheit	80 degrees Fahrenheit	80 degrees Fahrenheit
Total Sample Volume (Standard Conditions) - Vmstd	71.3 dscf	72.0 dscf	70.6 dscf
Total Particulates - mn		3.3 mg	3.2 mg
Particulate Concentration (dry-standard)	0.00005 grams/dscf	0.00005 grams/dscf	0.00005 grams/dscf
Particulate Emission Rate	0.39 grams/hour	0.39 grams/hour	0.39 grams/hour
Adjusted Emissions	0.84 grams/hour	0.84 grams/hour	0.83 grams/hour
Difference from Average		0.00 grams/hour	0.00 grams/hour
7.5% of the average emission rate	0.06		
Weighted Average Emission Rate Limit	4.10 grams/hour		
7.5% of the weighted average emission rate limit	0.31		

Results Are Acceptable

Wood Heater Test Data - EPA Method 5G

Run: 4
 Manufacturer: CFM
 Model: Small Dutch West
 Tracking No.: 642
 Project No.: 259-S-04-3
 Test Date: 10-Jun-04
 Beginning Clock Time: 09:36
 Recording Interval: 10 min.
 Total Sampling Time: 200 min.

Velocity Traverse Data								
	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8
Initial dP	0.038	0.046	0.046	0.038	0.038	0.048	0.048	0.036
Initial Temp.	97	97	97	97	96	96	96	96

OMNI Equipment Numbers: _____

PM Control Module: _____
 Dilution Tunnel MW(dry): 29.00 lb/lb-mole
 Dilution Tunnel MW(wet): 28.56 lb/lb-mole
 Dilution Tunnel H2O: 4.00 percent
 Dilution Tunnel Static: -0.150 "H2O
 Pitot Tube Cp: 0.99
 Meter Box Y Factor: 1.0035 (1) 1.0015 (2)
 Barometric Pressure: Begin Middle End Average
 29.57 29.55 29.55 29.56 "Hg

Signature/Date: _____
 Tunnel Velocity: 14.12 ft/sec
 Initial Tunnel Flow: 143.3 scfm
 Average Tunnel Flow: 143.3 scfm
 Tunnel Area: 0.18825 ft²
 Post-Test Leak Check: 0@17 cfm@"Hg
 Fuel Moisture (dry basis): 19.68 %
 Total Particulate (1): 3.3 mg
 Total Particulate (2): 3.2 mg

Elapsed Time	Particulate Sampling Data														Fuel Weight, lb		Wood Heater Temperature Data, oF											Stack	
	Gas Meter Cubic Feet (1)	Gas Meter Cubic Feet (2)	Sample Rate, cfm (1)	Sample Rate, cfm (2)	Orifice dH	Meter oF (1)	Meter oF (2)	Meter Vac. In. Hg. (1)	Meter Vac. In. Hg. (2)	Dilution Tunnel Temp.	Dilution Tunnel dP	Pro. Rate (10%) (1)	Pro. Rate (10%) (2)	Scale Reading	Weight Change	Firebox Top	Firebox Right	Firebox Left	Firebox Back	Firebox Bottom	Catalyst Exit	Average Surface	Stack	Filter	Impinger exit	Ambient	Draft In. H2O		
0	363.300	364.900			0.00	79	79	0	0	97	0.042			10.4		308	310	277	155	482		306.4	259	79		79	0.047		
10	366.970	368.490	0.37	0.36	0.70	80	81	3.5	3.5	100	0.042	100	99	9.6	-0.8	313	272	260	182	430		291.4	350	82		78	0.060		
20	370.710	372.150	0.37	0.37	0.70	80	80	3.5	3.5	103	0.042	102	102	8.6	-1	325	255	244	207	401		286.4	374	83		80	0.055		
30	374.430	375.900	0.37	0.38	0.70	80	80	3.5	3.5	105	0.042	102	104	7.5	-1.1	345	253	235	222	388		288.6	409	85		80	0.067		
40	378.150	379.540	0.37	0.36	0.70	79	80	3.5	3.5	105	0.042	102	101	6.5	-1	365	257	232	236	376		293.2	391	86		78	0.067		
50	381.890	383.200	0.37	0.37	0.70	80	80	3.5	3.5	103	0.042	102	102	5.6	-0.9	360	265	234	228	371		291.6	378	87		79	0.065		
60	385.610	386.820	0.37	0.36	0.70	80	81	3.5	3.5	103	0.042	101	100	4.5	-1.1	354	277	236	217	375		291.8	366	87		79	0.062		
70	389.280	390.450	0.37	0.36	0.70	80	80	3.5	3.5	101	0.042	100	101	4.0	-0.5	355	295	241	208	373		294.4	358	86		80	0.061		
80	393.010	394.110	0.37	0.37	0.70	80	81	3.5	3.5	100	0.042	101	101	3.3	-0.7	358	306	248	198	365		295.0	343	86		79	0.059		
90	396.730	397.780	0.37	0.37	0.70	80	81	3.5	3.5	99	0.042	101	101	2.8	-0.5	355	310	254	186	361		293.2	321	85		79	0.056		
100	400.430	401.390	0.37	0.36	0.70	80	81	3.5	3.5	96	0.042	100	99	2.4	-0.4	341	310	261	168	361		288.2	286	85		79	0.050		
110	404.030	405.120	0.36	0.37	0.70	80	81	3.5	3.5	95	0.042	98	103	2.0	-0.4	327	308	267	154	361		283.4	274	84		80	0.049		
120	407.830	408.560	0.38	0.34	0.70	79	80	3.5	3.5	95	0.042	103	95	1.7	-0.3	316	307	269	147	362		280.2	263	83		80	0.046		
130	411.530	412.300	0.37	0.37	0.70	79	80	3.5	3.5	95	0.042	100	103	1.3	-0.4	313	309	271	144	358		279.0	275	83		79	0.047		
140	415.220	415.940	0.37	0.36	0.70	79	80	3.5	3.5	96	0.042	100	100	1.0	-0.3	317	313	271	145	353		279.8	290	84		80	0.050		
150	418.900	419.590	0.37	0.36	0.70	79	80	3.5	3.5	93	0.042	100	100	0.7	-0.3	310	314	270	147	349		278.0	259	83		80	0.045		
160	422.610	423.220	0.37	0.36	0.70	79	80	3.5	3.5	93	0.042	100	100	0.6	-0.1	303	315	268	139	349		274.8	247	82		80	0.043		
170	426.300	426.900	0.37	0.37	0.70	80	80	3.5	3.5	92	0.042	100	101	0.4	-0.2	294	314	265	133	345		270.2	239	82		80	0.043		
180	430.000	430.500	0.37	0.36	0.70	80	81	3.5	3.5	91	0.040	103	101	0.3	-0.1	284	311	260	130	343		265.6	231	82		79	0.040		
190	433.710	434.150	0.37	0.36	0.70	80	80	3.5	3.5	90	0.042	100	100	0.1	-0.2	276	312	254	126	337		261.0	223	82		79	0.040		
200	437.414	437.790	0.37	0.36	0.70	80	81	3.5	3.5	90	0.042	100	100	0.0	-0.1	269	312	247	122	330		256.0	217	81		79	0.038		
Avg/Total	74.114	72.890	0.37	0.36	0.67	79.67	80.33			97.21	0.042	100.78	100.77									50		83.67	#DIV/0!		0.052		

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Final Laboratory Report - Method 5G Dilution Tunnel Particulate Calculations

Client Name: CFM Vermont Casting Equipment Numbers: Train 1 Run #: 4
 Model: DutchWest Small
 Project No.: 259-S-04-3 Date: 06/10/04
 Tracking No.: 642

Sample Component	Reagent	Filter # or Volume, ml	Weights			
			Final, mg	Tare, mg	Blank, mg/ml	Particulate, mg
A. Front filter catch	Filter	C983	115.0	112.5		2.5
B. Rear filter catch	Filter	C982	105.1	105.0		0.1
C. Rinse of probe and filter assembly	Acetone	G	86803.7	86803.0	0.0000	0.7

Total Particulate, mg :	3.3
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Component	Equations:
A. Front filter catch	Final (mg) - Tare (mg) = Particulate, mg
B. Rear filter catch	Final (mg) - Tare (mg) = Particulate, mg
C. Rinse of probe and filter assembly	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg

Analyst: JML Date: 6-25-04

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Final Laboratory Report - Method 5G Dilution Tunnel Particulate Calculations

Client Name: CFM Vermont Casting Equipment Numbers: Train 2 Run #: 4
 Model: DutchWest Small _____ Date: 06/10/04
 Project No.: 259-S-04-3 _____
 Tracking No.: 642 _____

Sample Component	Reagent	Filter # or Volume, ml	Weights			
			Final, mg	Tare, mg	Blank, mg/ml	Particulate, mg
A. Front filter catch	Filter	C981	99.8	97.3		2.5
B. Rear filter catch	Filter	C980	99.8	99.5		0.3
C. Rinse of probe and filter assembly	Acetone	B	76817.0	76816.6	0.0000	0.4

Total Particulate, mg :	3.2
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Component	Equations:
A. Front filter catch	Final (mg) - Tare (mg) = Particulate, mg
B. Rear filter catch	Final (mg) - Tare (mg) = Particulate, mg
C. Rinse of probe and filter assembly	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg

Analyst: JW Date: 6-25-04

2-2117A7-65

STOVE TEMPERATURE TEST DATA - METHOD 5G

Client/Model: CFM SM, Dutch West Project #: 259-s-04-3 Tracking #: 642 Page of
 Date: 6-10-04 Test Crew: H. Morgan, R. Sparwasser Run #: 3 4 11
 OMNI Equipment ID #:

Preburn Test [X]	Coal Bed: Data: 0 =										Range: 2.1-2.6			Actual: 2.6								
	Fuel Weight	Delta Weight	Stack Draft	TEMPERATURES (oF)				TEMPERATURES (oF)			Flue	Coal Bed: 3 Not Used										
Time	0	10	20	30	40	50	60	70	80	90	00	10	20	30	40	50	60	70	80	90	AVG	
	0.83	1.2	0.7	0.7	0.4	0.5	0.2	0.2	0.47													
	78	80	80	80	80	80	79	79														
	608	501	441	404	367	345	323	308														
	416	463	465	467	489	489	485	482														
	166	181	184	180	178	174	164	155														
	259	296	300	297	292	289	283	277														
	251	289	296	310	308	312	311	310														
	539	412	329	370	313	294	268	259														

stove 20'
stove 40'

Technician signature: H. A. Morgan Date: 6-10-04

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FUEL DATA

Client: CFM
 Model: SM DUTCH WEST
 Project #: 256-259-5-04-3 Tracking #: 642
 Date: 6-10-04 Test Crew: H. MORGAN, R. SPARWASSER Run #: PK 4
 OMNI Equipment ID #: _____
 FUEL LOAD PREPARED BY: K. MORGAN, R. SPARWASSER
 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	<u>8</u> ft	<u>19.3</u>	<u>19.3</u>	<u>19.0</u>	<u>2x4</u>
2	<u>8</u> ft	<u>21.9</u>	<u>19.1</u>	<u>19.1</u>	<u>2x4</u>
3	_____ ft	_____	_____	_____	_____

Length of cut pieces: 6 inches Pre-Burn Fuel Average Moisture: 19.47 19.62 AS

Time (clock): 2:00 Room Temperature (F): 72 Initials: RM

TEST FUEL

FUEL TYPE AND AMOUNT: 2x4 3 @ 16" 4x4 1 @ 16"
 CALCULATED LOAD WEIGHT: 11.2 ACTUAL LOAD WEIGHT: 10.5 @ 16" (2x4) 6.1
1 @ 16" (4x4) 4.3
10.4 Total

FUEL PIECE LENGTH: 16"

MOISTURE CONTENT (METER -- DRY BASIS)

PIECE	READINGS			TYPE
1	<u>19.9</u>	<u>19.9</u>	<u>19.8</u>	<u>4x4</u>
2	<u>19.1</u>	<u>19.3</u>	<u>18.8</u>	<u>2x4</u>
3	<u>20.1</u>	<u>19.7</u>	<u>20.8</u>	<u>2x4</u>
4	<u>20.3</u>	<u>19.3</u>	<u>19.1</u>	<u>2x4</u>
5	_____	_____	_____	_____
6	_____	_____	_____	_____
7	_____	_____	_____	_____
8	_____	_____	_____	_____
9	_____	_____	_____	_____
10	_____	_____	_____	_____

OVERALL TEST FUEL LOAD MOISTURE AVERAGE: 19.68

Time (clock): 9:15 Room Temperature (F): 72 Initials: JK

Technician signature: H. Morgan Date: 6-10-04

Run Notes

Client/Model: CFM
 Model: Small Dutch West
 Project #: 259-S-04-3
 Tracking Number: 624

Run #: 4 Date: 6-10-04

Test Crew: K. Morgan, R. Sparwasser

OMNI Equipment ID Numbers: _____

PREBURN

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

PRIMARY:

OPEN 12°

SECONDARY: FIXED

TERTIARY: N/A

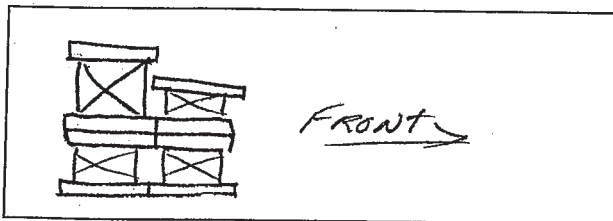
FAN: ON-High

PREBURN SETTINGS AND ACTIVITIES

TIME	AIR (THERMO) CHANGES PRIMARY/SECONDARY/TERTIARY	FAN SETTING CHANGE	ADD FUEL + WT.	ADD FUEL - WT.	RAKE COAL	COMMENT
0	TEST SETTING					
20					X	STIR
40					X	STIR
70					X	LEVELED

TEST

TEST FUEL CONFIGURATION SKETCH
(INDICATE VIEW ANGLE)



START UP PROCEDURES

BYPASS: NOT USED

FUEL LOADING: Loaded by 49 sec

DOOR: Closed by 65 sec.

PRIMARY AIR: Not used for start-up.

OTHER: _____

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

PRIMARY:

SAME AS ABOVE

SECONDARY: FIXED

TERTIARY: N/A

FAN: ON-High

Technician signature: K. Morgan

Date: 6-10-04

Supplemental Data EPA 5G/5H

Client: CFM

Model: SMALL DUTCH WEST

Project No.: 259-5-04-3 Tracking No.:

Date: 6-10-04 Run No.: 4 Booth: _____

Test Crew: K. Morgan, R. SPARWASSER Start Time: 09:36 Stop Time: 12:56

OMNI Equipment #'s: _____

Gas Analyzer Train Leak Check:

Stack:

Dilution Tunnel (Method 5G Only):

Initial: N/A

Initial: N/A

Final: N/A

Final: N/A

Calibrations: Span Gas CO₂: N/A O₂: N/A CO: N/A CO₂(DT): N/A

Time	N ₂ Span	N ₂ Span	N ₂ Span	N ₂ Span	N ₂ Span	N ₂ Span	N ₂ Span
O ₂							
CO ₂			<u>N/A</u>				
CO							
CO ₂ (DT)							

Stack Diameter (inches): 6.0

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

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

Induced Draft: 0 %Smoke Capture: 100

Pitot Tube Leak Test: Pre: φ @ 3.1" W.C. Post: φ @ 3.5" W.C.

Flue Pipe Cleaned Prior to First Test in Series: Date: 6-07-04 Initials: K

	Initial	Middle	Ending
Pb (in. Hg)	<u>29.57</u>	<u>29.55</u>	<u>29.55</u>
Room Temp (°F)	<u>79</u>	<u>79</u>	<u>79</u>

Technician signature: K. Morgan Date: 6-10-04

Model: DutchWest Small
CFM US Corporation
62 Vermont Castings Road
Bethel, VT 05032

Run 5

Wood Heater Test Data - EPA Method 5G

Run: 5
 Manufacturer: CFM
 Model: Small Dutch West
 Tracking No.: 642
 Project No.: 259-S-04-3
 Test Date: 10-Jun-04
 Beginning Clock Time: 15:37
 Recording Interval: 10 min.
 Total Sampling Time: 160 min.

Velocity Traverse Data								
	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8
Initial dP	0.036	0.046	0.046	0.038	0.034	0.046	0.046	0.036
Initial Temp.	102	102	102	102	101	101	101	101

OMNI Equipment Numbers: _____

PM Control Module: _____
 Dilution Tunnel MW(dry): 29.00 lb/lb-mole
 Dilution Tunnel MW(wet): 28.56 lb/lb-mole
 Dilution Tunnel H2O: 4.00 percent
 Dilution Tunnel Static: -0.152 "H2O
 Pitot Tube Cp: 0.99
 Meter Box Y Factor: 1.0035 (1) 1.0015 (2)
 Barometric Pressure: Begin Middle End Average
29.55 29.53 29.51 29.53 "Hg

Signature/Date: _____
 Tunnel Velocity: 14.00 ft/sec.
 Initial Tunnel Flow: 140.4 scfm
 Average Tunnel Flow: 140.5 scfm
 Tunnel Area: 0.18825 ft²
 Post-Test Leak Check: 0.01@15 cfm@"Hg
 Fuel Moisture (dry basis): 20.02 %
 Total Particulate (1): 1.8 mg
 Total Particulate (2): 1.7 mg

Elapsed Time	Particulate Sampling Data														Fuel Weight, lb		Wood Heater Temperature Data, oF											Stack
	Gas Meter Cubic Feet (1)	Gas Meter Cubic Feet (2)	Sample Rate, cfm (1)	Sample Rate, cfm (2)	Orifice dH	Meter oF (1)	Meter oF (2)	Meter Vac. In. Hg. (1)	Meter Vac. In. Hg. (2)	Dilution Tunnel Temp.	Dilution Tunnel dP	Pro. Rate (10%) (1)	Pro. Rate (10%) (2)	Scale Reading	Weight Change	Firebox Top	Firebox Right	Firebox Left	Firebox Back	Firebox Bottom	Catalyst Exit	Average Surface	Stack	Filter	Impinger exit	Ambient	Draft In. H2O	
0	437.902	438.301			0.00	79	79	0	0	102	0.041			10.4		351	378	286	378	488		376.2	308	77		77	0.055	
10	441.530	441.860	0.36	0.36	0.35	79	80	4	4	106	0.041	101	100	9.3	-1.1	349	331	276	196	456		321.6	394	84		78	0.068	
20	445.230	445.560	0.37	0.37	0.35	79	80	4	4	108	0.041	103	104	8.0	-1.3	362	311	261	224	426		316.8	420	85		79	0.070	
30	448.900	449.150	0.37	0.36	0.35	80	80	4	4	112	0.041	103	101	6.7	-1.3	398	318	250	246	398		322.0	457	89		79	0.075	
40	452.510	452.720	0.36	0.36	0.35	79	80	4	4	113	0.041	101	101	5.4	-1.3	423	337	247	257	378		328.4	449	89		79	0.074	
50	456.070	456.260	0.36	0.35	0.35	79	80	4	4	112	0.041	100	100	4.3	-1.1	428	351	250	253	369		330.2	442	86		79	0.073	
60	459.650	459.840	0.36	0.36	0.35	80	80	4	4	109	0.041	100	101	3.4	-0.9	430	372	254	243	364		332.6	423	85		79	0.070	
70	463.320	463.430	0.37	0.36	0.35	79	80	4	4	105	0.041	102	101	2.8	-0.6	419	381	262	216	366		328.8	385	85		79	0.065	
80	466.980	467.010	0.37	0.36	0.35	79	80	4	4	101	0.041	102	100	2.3	-0.5	396	374	269	189	367		319.0	339	84		76	0.060	
90	470.620	470.620	0.36	0.36	0.35	78	80	4	4	100	0.041	101	101	2.0	-0.3	375	372	273	173	369		312.4	322	83		79	0.058	
100	474.250	474.220	0.36	0.36	0.35	78	80	4	4	99	0.041	101	100	1.5	-0.5	358	372	279	161	376		309.2	307	83		80	0.053	
110	477.870	477.830	0.36	0.36	0.35	79	80	4	4	98	0.041	100	101	1.1	-0.4	346	370	279	152	384		306.2	299	83		80	0.053	
120	481.490	481.440	0.36	0.36	0.35	80	80	4	4	98	0.041	100	101	0.8	-0.3	341	366	279	150	392		305.6	294	84		80	0.050	
130	485.100	485.050	0.36	0.36	0.35	81	80	4	4	97	0.041	100	101	0.5	-0.3	330	361	280	146	400		303.4	277	83		82	0.048	
140	488.720	488.670	0.36	0.36	0.35	82	81	4	4	97	0.041	100	101	0.3	-0.2	320	353	281	142	403		299.8	272	84		81	0.048	
150	492.340	492.280	0.36	0.36	0.35	83	82	4	4	96	0.041	99	100	0.1	-0.2	312	346	279	139	400		295.2	264	85		81	0.048	
160	495.957	495.893	0.36	0.36	0.35	83	83	4	4	95	0.041	99	100	0.0	-0.1	303	339	279	136	394		290.2	259	84		82	0.048	
Avg/Total	58.055	57.592	0.36	0.36	0.33	79.82	80.29			102.79	0.041	100.77	100.76									86		84.29	#DIV/0!		0.060	

7-40 AF 7-1.5

Wood Heater Test Data - EPA Method 5G

Manufacturer: CFM
 Model: Small Dutch West
 Project No.: 259-S-04-3
 Tracking No.: 642
 Run: 5
 Test Date: 06/10/04

Burn Rate	1.47 kg/hr dry
Average Tunnel Temperature	103 degrees Fahrenheit
Average Gas Velocity in Dilution Tunnel - vs	14.0 feet/second
Average Gas Flow Rate in Dilution Tunnel - Qsd	8431.8 dscf/hour
Average Delta p	0.041 inches H2O
Average Delta H	0.33 inches H2O
Total Time of Test	160 minutes

	AVERAGE	SAMPLE TRAIN 1	SAMPLE TRAIN 2
Total Sample Volume - Vm	57.82 cubic feet	58.06 cubic feet	57.59 cubic feet
Average Gas Meter Temperature	80 degrees Fahrenheit	80 degrees Fahrenheit	80 degrees Fahrenheit
Total Sample Volume (Standard Conditions) - Vmstd	56.0 dscf	56.3 dscf	55.7 dscf
Total Particulates - mn		1.8 mg	1.7 mg
Particulate Concentration (dry-standard)	0.00003 grams/dscf	0.00003 grams/dscf	0.00003 grams/dscf
Particulate Emission Rate	0.26 grams/hour	0.27 grams/hour	0.26 grams/hour
Adjusted Emissions	0.60 grams/hour	0.61 grams/hour	0.59 grams/hour
Difference from Average		0.01 grams/hour	0.01 grams/hour
7.5% of the average emission rate	0.05		
Weighted Average Emission Rate Limit	4.10 grams/hour		
7.5% of the weighted average emission rate limit	0.31		

Results Are Acceptable

Final Laboratory Report - Method 5G Dilution Tunnel Particulate Calculations

Client Name: CFM Vermont Casting Equipment Numbers: Train 1 Run #: 5
 Model: DutchWest Small Date: 06/10/04
 Project No.: 259-S-04-3
 Tracking No.: 642

Sample Component	Reagent	Filter # or Volume, ml	Weights			
			Final, mg	Tare, mg	Blank, mg/ml	Particulate, mg
A. Front filter catch	Filter	D050	107.0	105.6		1.4
B. Rear filter catch	Filter	D049	98.6	98.6		0.0
C. Rinse of probe and filter assembly	Acetone	P	72374.3	72373.9	0.0000	0.4

Total Particulate, mg :	1.8
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Component	Equations:
A. Front filter catch	$\text{Final (mg)} - \text{Tare (mg)} = \text{Particulate, mg}$
B. Rear filter catch	$\text{Final (mg)} - \text{Tare (mg)} = \text{Particulate, mg}$
C. Rinse of probe and filter assembly	$(\text{Final, mg} - \text{Tare, mg}) - (\text{Blank, mg/ml} \times \text{Volume, ml}) = \text{Particulate, mg}$

Analyst: JMW Date: 6-25-04

2-42 of 2-65

Final Laboratory Report - Method 5G Dilution Tunnel Particulate Calculations

Client Name: CFM Vermont Casting Equipment Numbers: Train 2 Run #: 5
 Model: DutchWest Small Project No.: 259-S-04-3 Date: 06/10/04
 Tracking No.: 642

Sample Component	Reagent	Filter # or Volume, ml	Weights			
			Final, mg	Tare, mg	Blank, mg/ml	Particulate, mg
A. Front filter catch	Filter	D035	99.0	97.4		1.6
B. Rear filter catch	Filter	D034	98.2	98.1		0.1
C. Rinse of probe and filter assembly	Acetone	8	76914.7	76914.7	0.0000	0.0

Total Particulate, mg :	1.7
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Component	Equations:
A. Front filter catch	Final (mg) - Tare (mg) = Particulate, mg
B. Rear filter catch	Final (mg) - Tare (mg) = Particulate, mg
C. Rinse of probe and filter assembly	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg

Analyst: *H.A. Wong* Date: 7-16-04

STOVE TEMPERATURE TEST DATA - METHOD 5G

Client/Model: CFM Small Dutch West Project #: 257-s Tracking #: 642 Page ___ of ___
 Date: 6-10-04 Test Crew: K. Morgan, R. Sprewnasser Run #: 145
 OMNI Equipment ID #: _____

Preburn Test	Coal Bed: _____										Actual: _____	
	Time	Fuel Weight	Delta Weight	Stack Draft	Ambient	Top 4	Bottom	Back 7	Left 6	Right 5	Flue 3	Catalyst
0	6.5			-.085	79	645	443	144	247	415	574	
10	5.0	-1.5		-.074	78	513	492	184	271	405	450	
20	4.2	-0.8		-.064	79	450	494	195	280	396	352	
30	3.5	0.7		-.064	79	430	494	194	284	405	387	
40	3.2	0.3		.058	78	392	490	187	287	396	331	
50	2.9	0.3		.058	78	365	489	178	286	386	324	
60	2.6	0.3		.055	77	351	488	173	286	378	308	
80												
90												
00												
10												
20												
30												
40												
50												
60												
70												
80												
90												
AVG												

star @ 20
star @ 40

Technician signature: K. Morgan Date: 6-11-04

2-11622-65

FUEL DATA

Client: CFM

Model: Sm. Dutch West

Project #:

Tracking #:

Date: 6-10-04

Test Crew: K. Morgan, R. Sparwasser

Run #: 5

OMNI Equipment ID #:

FUEL LOAD PREPARED BY: K. Morgan

FUEL: DOUGLAS-FIR SPECIES, UNTREATED, AIR-DRIED, STANDARD GRADE OR BETTER, DIMENSIONAL LUMBER.

PRE-BURN FUEL					
MOISTURE CONTENT (METER -- DRY BASIS)					
CALIBRATION:	Cal Value (1) = 12%	Actual Reading	<u>12.6</u>		
	Cal Value (2) = 22%	Actual Reading	<u>22.0</u>		
Piece	Length	Readings			Type
1	<u>8</u> ft	<u>19.6</u>	<u>19.1</u>	<u>18.9</u>	<u>2x4</u>
2	<u>8</u> ft	<u>20.6</u>	<u>21.2</u>	<u>19.1</u>	<u>2x4</u>
3	_____ ft	_____	_____	_____	_____
Length of cut pieces: <u>36 @ 6"</u> inches		Pre-Burn Fuel Average Moisture: <u>19.75%</u>			
Time (clock): <u>14:00</u>		Room Temperature (F): <u>76</u>	Initials: <u>K</u>		

TEST FUEL					
FUEL TYPE AND AMOUNT:	<u>2 x 4</u>	<u>3</u>	<u>4 x 4</u>	<u>1</u>	
CALCULATED LOAD WEIGHT:	<u>11.2</u>	ACTUAL LOAD WEIGHT:		<u>6.3</u>	(2 x 4)
				<u>4.1</u>	(4 x 4)
FUEL PIECE LENGTH:	<u>16.0"</u>			<u>10.4</u>	Total
				<u>10.4</u>	<u>K</u>
MOISTURE CONTENT (METER -- DRY BASIS)					
PIECE	READINGS			TYPE	
1	<u>19.2</u>	<u>20.8</u>	<u>20.4</u>	<u>2x4</u>	
2	<u>19.4</u>	<u>21.2</u>	<u>21.2</u>	<u>2x4</u>	
3	<u>20.5</u>	<u>18.6</u>	<u>19.5</u>	<u>2x4</u>	
4	<u>19.1</u>	<u>20.3</u>	<u>20.0</u>	<u>4x4</u>	
5	_____	_____	_____	_____	
6	_____	_____	_____	_____	
7	_____	_____	_____	_____	
8	_____	_____	_____	_____	
9	_____	_____	_____	_____	
10	_____	_____	_____	_____	
OVERALL TEST FUEL LOAD MOISTURE AVERAGE: <u>20.02%</u>					
Time (clock): <u>14:05</u>		Room Temperature (F): <u>77</u>	Initials: <u>K</u>		

Technician signature: K. J. Morgan Date: 6-10-04

Run Notes

Client/Model: CFM
 Model: SMALL DUTCH WEST
 Project #: 259-S-04-3
 Tracking Number: 642
 Run #: 5 Date: 6-10-04
 Test Crew: K. Morgan, R. Sparwasser
 OMNI Equipment ID Numbers: _____

PREBURN

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

PRIMARY:

OPEN 20°

SECONDARY: FIXED

TERTIARY: N/A

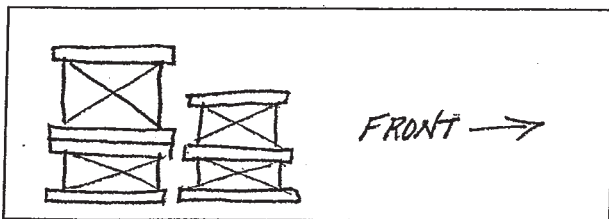
FAN: FAN ON - High

PREBURN SETTINGS AND ACTIVITIES

TIME	AIR (THERMO) CHANGES PRIMARY/SECONDARY/TERTIARY	FAN SETTING CHANGE	ADD FUEL + WT.	ADD FUEL - WT.	RAKE COAL	COMMENT
0	<u>TEST SETTING</u>					
20					X	<u>STIR</u>
40					X	<u>STIR</u>
60					X	<u>LEVELED</u>

TEST

TEST FUEL CONFIGURATION SKETCH
(INDICATE VIEW ANGLE)



START UP PROCEDURES

BYPASS: Not Used
 FUEL LOADING: Loaded by 45 sec.
 DOOR: Closed by 60 sec.
 PRIMARY AIR: Not Used - Remained at test setting
 OTHER: _____

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

PRIMARY:

SAME AS ABOVE

SECONDARY: FIXED

TERTIARY: N/A

FAN: FAN ON - High

Technician signature: R. Sparwasser

Date: 6-10-04

Supplemental Data EPA 5G/5H

Client: CFM

Model: SMALL DUTCH WEST

Project No.: 259-S-04-3 Tracking No.: 642

Date: 6-10-04 Run No.: 5 Booth: _____

Test Crew: K. Morgan, R. SPARWASSER Start Time: 15:37 Stop Time: 18:17

OMNI Equipment #'s: _____

Gas Analyzer Train Leak Check:

Stack:

Dilution Tunnel (Method 5G Only):

Initial: N/A

Initial: N/A

Final: N/A

Final: N/A

Calibrations: Span Gas CO₂: N/A O₂: N/A CO: N/A CO₂(DT): N/A

Time	N ₂ Span	N ₂ Span	N ₂ Span	N ₂ Span	N ₂ Span	N ₂ Span	N ₂ Span
O ₂							
CO ₂							
CO							
CO ₂ (DT)							

Stack Diameter (inches): 6.0

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

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

Induced Draft: 0 %Smoke Capture: 100

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

Flue Pipe Cleaned Prior to First Test in Series: Date: 6-07-04 Initials: KL

	Initial	Middle	Ending
Pb (in. Hg)	<u>29.55</u>	<u>29.53</u>	<u>29.51</u>
Room Temp (°F)	<u>77</u>	<u>76</u>	<u>82</u>

Technician signature: R. Sparwasser Date: 6-10-04

Model: DutchWest Small
CFM US Corporation
62 Vermont Castings Road
Bethel, VT 05032

Run 6

Wood Heater Test Data - EPA Method 5G

Manufacturer: CFM
 Model: Small Dutch West
 Project No.: 259-S-04-3
 Tracking No.: 642
 Run: 6
 Test Date: 06/11/04

Burn Rate	1.37 kg/hr dry
Average Tunnel Temperature	104 degrees Fahrenheit
Average Gas Velocity in Dilution Tunnel - vs	14.7 feet/second
Average Gas Flow Rate in Dilution Tunnel - Qsd	8834.2 dscf/hour
Average Delta p	0.045 inches H2O
Average Delta H	0.74 inches H2O
Total Time of Test	170 minutes

	AVERAGE	SAMPLE TRAIN 1	SAMPLE TRAIN 2
Total Sample Volume - Vm	62.73 cubic feet	63.49 cubic feet	61.98 cubic feet
Average Gas Meter Temperature	80 degrees Fahrenheit	80 degrees Fahrenheit	80 degrees Fahrenheit
Total Sample Volume (Standard Conditions) - Vmstd	60.9 dscf	61.7 dscf	60.1 dscf
Total Particulates - mn		6.4 mg	6.1 mg
Particulate Concentration (dry-standard)	0.00010 grams/dscf	0.00010 grams/dscf	0.00010 grams/dscf
Particulate Emission Rate	0.91 grams/hour	0.92 grams/hour	0.90 grams/hour
Adjusted Emissions	1.68 grams/hour	1.69 grams/hour	1.66 grams/hour
Difference from Average		0.02 grams/hour	0.02 grams/hour
7.5% of the average emission rate	0.13		
Weighted Average Emission Rate Limit	4.10 grams/hour		
7.5% of the weighted average emission rate limit	0.31		

Results Are Acceptable

2-119-2-2-1-E

Wood Heater Test Data - EPA Method 5G

Run: 6
 Manufacturer: CFM
 Model: Small Dutch West
 Tracking No.: 642
 Project No.: 259-S-04-3
 Test Date: 11-Jun-04
 Beginning Clock Time: 09:41
 Recording Interval: 10 min.
 Total Sampling Time: 170 min.

Velocity Traverse Data								
	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8
Initial dP	0.034	0.050	0.048	0.042	0.042	0.050	0.052	0.042
Initial Temp.	115	115	115	115	113	113	112	112

OMNI Equipment Numbers: _____

PM Control Module: _____
 Dilution Tunnel MW(dry): 29.00 lb/lb-mole
 Dilution Tunnel MW(wet): 28.56 lb/lb-mole
 Dilution Tunnel H2O: 4.00 percent
 Dilution Tunnel Static: -0.160 "H2O
 Pitot Tube Cp: 0.99
 Meter Box Y Factor: 1.0035 (1) 1.0015 (2)
 Barometric Pressure: Begin Middle End Average
29.58 29.58 29.58 29.58 "Hg

Signature/Date: _____
 Tunnel Velocity: 14.67 ft/sec.
 Initial Tunnel Flow: 145.6 scfm
 Average Tunnel Flow: 147.2 scfm
 Tunnel Area: 0.18825 ft²
 Post-Test Leak Check: 0.01@17 cfm/"Hg
 Fuel Moisture (dry basis): 22.53 %
 Total Particulate (1): 6.4 mg
 Total Particulate (2): 6.1 mg

Elapsed Time	Particulate Sampling Data													Fuel Weight, lb		Wood Heater Temperature Data, oF											Stack
	Gas Meter Cubic Feet (1)	Gas Meter Cubic Feet (2)	Sample Rate, cfm (1)	Sample Rate, cfm (2)	Orifice dH	Meter oF (1)	Meter oF (2)	Meter Vac. In. Hg. (1)	Meter Vac. In. Hg. (2)	Dilution Tunnel Temp.	Dilution Tunnel dP	Pro. Rate (10%) (1)	Pro. Rate (10%) (2)	Scale Reading	Weight Change	Firebox Top	Firebox Right	Firebox Left	Firebox Back	Firebox Bottom	Catalyst Exit	Average Surface	Stack	Filter	Impinger exit	Ambient	Draft In. H2O
0	496.403	496.404			0.70	78	78	0	0	114	0.045			10.5		386	379	303	163	555		357.2	345	78		78	-0.055
10	500.120	500.060	0.37	0.37	0.70	82	80	4.5	4.5	112	0.045	101	102	9.5	-1	369	337	299	174	513		338.4	405	84		78	-0.070
20	503.870	503.750	0.38	0.37	0.75	83	80	4.5	4.5	112	0.045	101	103	8.3	-1.2	372	309	282	206	474		328.6	436	87		78	-0.075
30	507.610	507.430	0.37	0.37	0.75	82	81	4.5	4.5	114	0.045	102	103	6.8	-1.5	390	309	270	224	448		328.2	456	88		80	-0.075
40	511.340	511.090	0.37	0.37	0.75	82	81	4.5	4.5	117	0.045	102	102	5.6	-1.2	426	317	270	239	430		336.4	490	88		80	-0.078
50	515.100	514.760	0.38	0.37	0.75	82	81	4.5	4.5	115	0.045	102	102	4.4	-1.2	439	329	278	248	409		340.6	460	89		79	-0.075
60	518.840	518.460	0.37	0.37	0.75	82	81	4.5	4.5	112	0.045	101	103	3.5	-0.9	433	341	288	238	401		340.2	421	88		81	-0.070
70	522.570	522.100	0.37	0.36	0.75	81	82	4.5	4.5	107	0.045	101	101	3.0	-0.5	410	346	296	208	396		331.2	368	87		80	-0.063
80	526.320	525.650	0.38	0.35	0.75	81	82	4.5	4.5	103	0.045	101	98	2.5	-0.5	384	349	302	179	402		323.2	329	85		79	-0.058
90	530.060	529.300	0.37	0.36	0.75	80	81	4.5	4.5	100	0.045	101	100	2.2	-0.3	363	347	302	164	405		316.2	315	84		79	-0.055
100	533.800	532.940	0.37	0.36	0.75	80	81	4.5	4.5	97	0.045	100	100	1.8	-0.4	347	344	301	154	406		310.4	304	83		77	0.053
110	537.630	536.600	0.38	0.37	0.75	80	80	4.5	4.5	97	0.045	103	101	1.4	-0.4	334	345	298	147	398		304.4	290	83		79	0.050
120	541.470	540.220	0.38	0.36	0.75	80	81	4.5	4.5	96	0.045	103	99	1.1	-0.3	329	346	295	142	390		300.4	283	82		79	0.050
130	545.100	544.000	0.36	0.38	0.75	79	80	4.5	4.5	96	0.045	98	104	0.7	-0.4	295	351	293	138	384		292.2	275	81		78	-0.048
140	548.750	547.500	0.36	0.35	0.75	79	80	4.5	4.5	94	0.045	98	96	0.5	-0.2	318	346	291	133	373		292.2	260	81		94	-0.045
150	552.440	551.160	0.37	0.37	0.75	78	79	4.5	4.5	94	0.045	99	101	0.3	-0.2	307	337	286	129	371		286.0	265	80		78	0.045
160	556.160	554.780	0.37	0.36	0.75	79	80	4.5	4.5	93	0.045	100	99	0.1	-0.2	299	331	280	129	368		281.4	260	80		79	0.045
170	559.888	558.388	0.37	0.36	0.75	78	79	4.5	4.5	93	0.045	100	99	0.0	-0.1	289	325	275	127	363		275.8	252	80		78	0.043
Avg/Total	63.485	61.984	0.37	0.36	0.74	80.33	80.39			103.65	0.045	100.68	100.69									81		83.78	#DIV/0!		-0.027

Final Laboratory Report - Method 5G Dilution Tunnel Particulate Calculations

Client Name: CFM Vermont Casting Equipment Numbers: Train 1 Run #: 6
 Model: DutchWest Small _____ Date: 06/11/04
 Project No.: 259-S-04-3 _____
 Tracking No.: 642 _____

Sample Component	Reagent	Filter # or Volume, ml	Weights			
			Final, mg	Tare, mg	Blank, mg/ml	Particulate, mg
A. Front filter catch	Filter	D033	104.8	98.7		6.1
B. Rear filter catch	Filter	D062	112.0	111.9		0.1
C. Rinse of probe and filter assembly	Acetone	K	78185.7	78185.5	0.0000	0.2

Total Particulate, mg :	6.4
-------------------------	-----

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	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg

Analyst: *JM* Date: 6-25-04

2-51 of 2-105

Final Laboratory Report - Method 5G Dilution Tunnel Particulate Calculations

Client Name: CFM Vermont Casting Equipment Numbers: Train 2 Run #: 6
 Model: DutchWest Small Project No.: 259-S-04-3 Date: 06/11/04
 Tracking No.: 642

Sample Component	Reagent	Filter # or Volume, ml	Weights			
			Final, mg	Tare, mg	Blank, mg/ml	Particulate, mg
A. Front filter catch	Filter	D061	105.7	99.7		6.0
B. Rear filter catch	Filter	D060	100.1	100.0		0.1
C. Rinse of probe and filter assembly	Acetone	L	78563.3	78563.3	0.0000	0.0

Total Particulate, mg :	6.1
-------------------------	-----

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

Analyst: *H. J. Morgan* Date: 7-16-04

STOVE TEMPERATURE TEST DATA - METHOD 5G

Client/Model: LFM CDW SMALL Project #: 259-S-03-3 Tracking #: 628 Page of
 Date: 6-11-04 Test Crew: K. Morgan, R. Sparwasser Run #: 6
 OMNI Equipment ID #:

Preburn Test	[X] []		Coal Bed: <u>2.1 - 2.6</u> Actual: <u>2.6</u>									
	Fuel Weight	Delta Weight	Stack Draft	Ambient	Top	Bottom	Back 7	Left 6	Right 5	Flue 3	Not Used Catalyst	
0	11.0		-0.90	71	580	304	122	184	244	671		
10	9.3	-1.7	-0.94	72	434	377	136	201	286	393		
20	2.9	-1.4	-0.72	71	414	410	155	210	306	484		
30	5.9	-2.2	-0.82	72	471	416	185	222	336	572		
40	4.3	-1.4	-0.79	75	487	462	212	245	348	540		
50	3.2	-1.1	-0.71	75	476	488	223	273	373	439		
60	2.9	-0.3	-0.61	76	422	517	189	292	378	365		
70	2.6	0.3	-0.55	78	386	555	163	203	379	345		
80												
90												
00												
10												
20												
30												
40												
50												
60												
70												
80												
90												
AVG												

Stove 20'
Stove 40'

PRELIMINARY 1.56 @ 1.8 g/hr

Technician signature: K. Morgan Date: 6-11-04

FUEL DATA

Client: CFM
 Model: Small Dutch west
 Project # 259-S-03-3 Tracking #: 642
 Date: 6-11-04 Test Crew: K Morgan / R Sparwasser Run #: 6
 OMNI Equipment ID #: _____
 FUEL LOAD PREPARED BY: R-Sparwasser
 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	<u>8</u> ft	<u>19.0</u>	<u>19.1</u>	<u>19.0</u>	<u>2x4</u>
2	<u>8</u> ft	<u>19.1</u>	<u>19.7</u>	<u>19.7</u>	<u>2x4</u>
3	_____ ft	_____	_____	_____	_____

Length of cut pieces: 6 inches 33 pcs Pre-Burn Fuel Average Moisture: 19.27
 Time (clock): 7:30 Room Temperature (F): 69 Initials: ROL

TEST FUEL

FUEL TYPE AND AMOUNT: 2 x 4 @ 16" 4 x 4 @ 16"
 CALCULATED LOAD WEIGHT: 11.2 ACTUAL LOAD WEIGHT: 6.5 (2 x 4)
4.0 (4 x 4)
10.5 Total

FUEL PIECE LENGTH: 16"

MOISTURE CONTENT (METER -- DRY BASIS)

PIECE	READINGS			TYPE
1	<u>22.2</u>	<u>22.1</u>	<u>22.2</u>	<u>2x4</u>
2	<u>22.1</u>	<u>22.1</u>	<u>22.4</u>	<u>2x4</u>
3	<u>22.5</u>	<u>22.7</u>	<u>23.8</u>	<u>2x4</u>
4	<u>23.8</u>	<u>22.5</u>	<u>21.9</u>	<u>4x4</u>
5	_____	_____	_____	_____
6	_____	_____	_____	_____
7	_____	_____	_____	_____
8	_____	_____	_____	_____
9	_____	_____	_____	_____
10	_____	_____	_____	_____

OVERALL TEST FUEL LOAD MOISTURE AVERAGE: 22.53
 Time (clock): 8:10 Room Temperature (F): 71 Initials: ROL

Technician signature: R. Sparwasser Date: 6-11-04

Run Notes

Client/Model: CFM
 Model: SMALL DUTCH NEST
 Project #: 259-S-04-3
 Tracking Number: 642
 Run #: 6 Date: 6-11-04
 Test Crew: K. Morgan, R. Sparwasser
 OMNI Equipment ID Numbers: _____

PREBURN

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

PRIMARY:

Fully Open
≈ 80°

SECONDARY: FIXED

TERTIARY: N/A

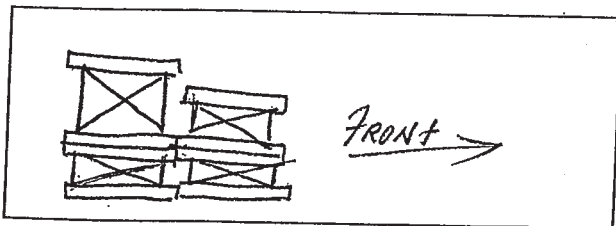
FAN: ON - High

PREBURN SETTINGS AND ACTIVITIES

TIME	AIR (THERMO) CHANGES PRIMARY/SECONDARY/TERTIARY	FAN SETTING CHANGE	ADD FUEL + WT.	ADD FUEL - WT.	RAKE COAL	COMMENT
0	TEST SETTING					
20					X	STIR
40					X	STIR
70					X	LEVEL

TEST

TEST FUEL CONFIGURATION SKETCH
(INDICATE VIEW ANGLE)



START UP PROCEDURES

BYPASS: Not Used
 FUEL LOADING: loaded by 45 seconds
 DOOR: closed by 53 seconds
 PRIMARY AIR: Remained un-touched - Not utilized for start up.
 OTHER: _____

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

PRIMARY:

SAME AS ABOVE

SECONDARY: FIXED

TERTIARY: N/A

FAN: ON - High

Technician signature: R. Sparwasser

Date: 6-11-04

Supplemental Data EPA 5G/5H

Client: CFM

Model: SMALL DUTCH WEST

Project No.: 259-S-04-3 Tracking No.: 642

Date: 6-11-04 Run No.: 6 Booth: _____

Test Crew: K. Morgan, R. SPARWASSER Start Time: 09:41 Stop Time: 12:21

OMNI Equipment #'s: _____

Gas Analyzer Train Leak Check:

Stack:

Dilution Tunnel (Method 5G Only):

Initial: N/A

Initial: N/A

Final: N/A

Final: N/A

Calibrations: Span Gas CO₂: N/A O₂: N/A CO: N/A CO₂(DT): N/A

Time	N ₂ Span	N ₂ Span	N ₂ Span	N ₂ Span	N ₂ Span	N ₂ Span	N ₂ Span
O ₂							
CO ₂			<u>N/A</u>				
CO							
CO ₂ (DT)							

Stack Diameter (inches): 6.0

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

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

Induced Draft: 0 %Smoke Capture: 100

Pitot Tube Leak Test: Pre: 0 @ 3.5" W.C. Post: 0 @ 3.2" W.C.

Flue Pipe Cleaned Prior to First Test in Series: Date: 6-07-04 Initials: 16

	Initial	Middle	Ending
Pb (in. Hg)	<u>29.58</u>	<u>29.58</u>	<u>29.58</u>
Room Temp (°F)	<u>78</u>	<u>79</u>	<u>78</u>

Technician signature: R. Sparwasser Date: 6-11-04

Model: DutchWest Small
CFM US Corporation
62 Vermont Castings Road
Bethel, VT 05032

Run 7.

Wood Heater Test Data - EPA Method 5G

Manufacturer: CFM
 Model: Small Dutch West
 Project No.: 259-S-04-3
 Tracking No.: 642
 Run: 7
 Test Date: 06/11/04

Burn Rate	2.08 kg/hr dry
Average Tunnel Temperature	109 degrees Fahrenheit
Average Gas Velocity in Dilution Tunnel - vs	14.5 feet/second
Average Gas Flow Rate in Dilution Tunnel - Qsd	8670.4 dscf/hour
Average Delta p	0.044 inches H2O
Average Delta H	0.64 inches H2O
Total Time of Test	110 minutes

	AVERAGE	SAMPLE TRAIN 1	SAMPLE TRAIN 2
Total Sample Volume - Vm	40.80 cubic feet	41.08 cubic feet	40.52 cubic feet
Average Gas Meter Temperature	79 degrees Fahrenheit	78 degrees Fahrenheit	79 degrees Fahrenheit
Total Sample Volume (Standard Conditions) - Vmstd	39.7 dscf	40.0 dscf	39.3 dscf
Total Particulates - mn		2.8 mg	3.7 mg
Particulate Concentration (dry-standard)	0.00008 grams/dscf	0.00007 grams/dscf	0.00009 grams/dscf
Particulate Emission Rate	0.71 grams/hour	0.61 grams/hour	0.82 grams/hour
Adjusted Emissions	1.37 grams/hour	1.20 grams/hour	1.54 grams/hour
Difference from Average		0.17 grams/hour	0.17 grams/hour
7.5% of the average emission rate	0.10		
Weighted Average Emission Rate Limit	4.10 grams/hour		
7.5% of the weighted average emission rate limit	0.31		
Results Are Acceptable			

Wood Heater Test Data - EPA Method 5G

Run: 7
 Manufacturer: CFM
 Model: Small Dutch West
 Tracking No.: 642
 Project No.: 259-S-04-3
 Test Date: 11-Jun-04
 Beginning Clock Time: 15:58
 Recording Interval: 10 min.
 Total Sampling Time: 110 min.

Velocity Traverse Data								
	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8
Initial dP	0.036	0.052	0.048	0.042	0.034	0.050	0.048	0.040
Initial Temp.	101	101	101	101	101	101	101	101

OMNI Equipment Numbers: _____

PM Control Module:
 Dilution Tunnel MW(dry): 29.00 lb/lb-mole
 Dilution Tunnel MW(wet): 28.56 lb/lb-mole
 Dilution Tunnel H₂O: 4.00 percent
 Dilution Tunnel Static: -0.146 H₂O
 Pitot Tube Cp: 0.99
 Meter Box Y Factor: 1.0035 (1) 1.0015 (2)
 Barometric Pressure: Begin Middle End Average
29.58 29.58 29.58 29.58 Hg

Signature/Date: _____
 Tunnel Velocity: 14.53 ft/sec.
 Initial Tunnel Flow: 145.1 scfm
 Average Tunnel Flow: 144.5 scfm
 Tunnel Area: 0.18825 ft²
 Post-Test Leak Check: .001@16.5 cfm@"Hg
 Fuel Moisture (dry basis): 20.04 %
 Total Particulate (1): 2.8 mg
 Total Particulate (2): 3.7 mg

Elapsed Time	Particulate Sampling Data														Fuel Weight, lb		Wood Heater Temperature Data, oF											Stack
	Gas Meter Cubic Feet (1)	Gas Meter Cubic Feet (2)	Sample Rate, cfm (1)	Sample Rate, cfm (2)	Orifice dH	Meter oF (1)	Meter oF (2)	Meter Vac. In. Hg. (1)	Meter Vac. In. Hg. (2)	Dilution Tunnel Temp.	Dilution Tunnel dP	Pro. Rate (10%) (1)	Pro. Rate (10%) (2)	Scale Reading	Weight Change	Firebox Top	Firebox Right	Firebox Left	Firebox Back	Firebox Bottom	Catalyst Exit	Average Surface	Stack	Filter	Impinger exit	Ambient	Draft In. H ₂ O	
0	560.200	558.702			0.00	78	80	0	0	101	0.044			10.1		359	368	296	166	394		316.6	299	74		75	0.053	
10	563.990	562.460	0.38	0.38	0.70	77	79	3	3	113	0.044	103	103	8.5	-1.6	374	336	285	191	378		312.8	451	87		77	0.073	
20	567.800	566.170	0.38	0.37	0.70	78	79	3	3	114	0.044	103	102	7.1	-1.4	388	316	271	227	368		314.0	472	87		76	0.075	
30	571.570	569.880	0.38	0.37	0.70	78	79	3	3	121	0.044	103	103	5.5	-1.6	424	333	265	243	366		326.2	515	88		79	0.078	
40	575.320	573.550	0.38	0.37	0.70	79	80	3	3	123	0.044	102	102	3.9	-1.6	460	363	266	256	363		341.6	529	88		79	0.080	
50	579.050	577.210	0.37	0.37	0.70	79	80	3	3	117	0.044	101	101	2.8	-1.1	469	394	275	251	369		351.6	461	88		78	0.073	
60	582.780	580.870	0.37	0.37	0.70	79	80	3	3	109	0.044	100	100	2.2	-0.6	441	393	283	212	382		342.2	384	87		79	0.065	
70	586.525	584.540	0.37	0.37	0.70	78	80	3	3	106	0.044	101	100	1.7	-0.5	416	391	287	187	392		334.6	359	88		79	0.060	
80	590.240	588.220	0.37	0.37	0.70	78	80	3	3	102	0.044	100	100	1.2	-0.5	387	386	291	165	402		326.2	336	87		77	0.058	
90	593.940	591.890	0.37	0.37	0.70	79	79	3	3	101	0.044	99	100	0.8	-0.4	372	382	292	157	414		323.4	331	86		77	0.055	
100	597.610	595.560	0.37	0.37	0.70	78	79	3	3	100	0.044	98	100	0.4	-0.4	363	379	294	153	424		322.6	333	85		77	0.055	
110	601.280	599.220	0.37	0.37	0.70	77	78	3	3	100	0.044	98	100	0.0	-0.4	354	372	296	152	428		320.4	322	84		78	0.055	
Avg/Total	41.080	40.518	0.37	0.37	0.64	78.17	79.42			108.92	0.044	100.83	100.84									4		85.75	#DIV/0!		0.065	

2-59 AF 2-15

Final Laboratory Report - Method 5G Dilution Tunnel Particulate Calculations

Client Name: CFM Vermont Casting Equipment Numbers: Train 1 Run #: 7
 Model: DutchWest Small _____ Date: 06/11/04
 Project No.: 259-S-04-3 _____
 Tracking No.: _____ 642 _____

Sample Component	Reagent	Filter # or Volume, ml	Weights			
			Final, mg	Tare, mg	Blank, mg/ml	Particulate, mg
A. Front filter catch	Filter	C978	107.6	105.3		2.3
B. Rear filter catch	Filter	C977	100.6	100.6		0.0
C. Rinse of probe and filter assembly	Acetone	7	74725.2	74724.7	0.0000	0.5

Total Particulate, mg :	2.8
-------------------------	-----

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

Analyst: JML Date: 6-25-04

Final Laboratory Report - Method 5G Dilution Tunnel Particulate Calculations

Client Name: CFM Vermont Casting Equipment Numbers: Train 2 Run #: 7
 Model: DutchWest Small Date: 06/11/04
 Project No.: 259-S-04-3
 Tracking No.: 642

Sample Component	Reagent	Filter # or Volume, ml	Weights			
			Final, mg	Tare, mg	Blank, mg/ml	Particulate, mg
A. Front filter catch	Filter	C976	102.5	99.9		2.6
B. Rear filter catch	Filter	C988	99.7	100.0		-0.3
C. Rinse of probe and filter assembly	Acetone	M	77248.4	77247.4	0.0000	1.0

Total Particulate, mg :	3.3
-------------------------	-----

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

Analyst: JM Date: 6-25-04

STOVE TEMPERATURE TEST DATA - METHOD 5G

Client/Model: CFM Small Duster West Project #: 258-504-3 Page 642 of
 Date: 6-11-04 Test Crew: K. Moran Tracking #: 642
 OMNI Equipment ID #: Run #: 7

Time	Fuel Weight	Delta Weight	Stack Draft	TEMPERATURES (OF)								Actual: Coal Bed: 2.5	Not Used Catalyst
				Ambient	Top	Bottom	Back	Left	Right	Flue	3		
0	11.0		-1.090	73	676	432	148	299	323	621			
10	8.6	2.4	-1.088	73	555	453	175	301	342	554			
20	6.7	1.9	-1.085	73	529	489	230	307	376	532			
30	4.9	1.8	-1.083	73	520	421	268	308	390	511			
40	3.8	1.1	-1.078	73	506	408	273	312	384	412			
50	3.4	0.4	-1.068	73	460	399	249	311	379	395			
60	3.0	0.4	-1.060	72	410	399	202	305	378	337			
70	2.7	0.3	-1.058	72	377	401	176	300	375	327			
80	2.5	0.2	-1.053	74	359	394	166	296	365	299			
90													
AVG													

Technician signature: K. Moran Date: 6-11-04

FUEL DATA

Client: CFM
 Model: SMALL Dutch West
 Project #: 259-5-04-3 Tracking #: 642
 Date: 6-11-04 Test Crew: K. Morgan Run #: 7
 OMNI Equipment ID #: _____
 FUEL LOAD PREPARED BY: K. Morgan
 FUEL: DOUGLAS-FIR SPECIES, UNTREATED, AIR-DRIED, STANDARD GRADE OR BETTER,
 DIMENSIONAL LUMBER.

PRE-BURN FUEL
MOISTURE CONTENT (METER -- DRY BASIS)

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

Piece	Length	Readings			Type
1	<u>8</u> ft	<u>19.4</u>	<u>18.7</u>	<u>18.9</u>	<u>2x4</u>
2	<u>8</u> ft	<u>18.7</u>	<u>19.3</u>	<u>18.9</u>	<u>2x4</u>
3	ft				

Length of cut pieces: 31 @ 6 inches Pre-Burn Fuel Average Moisture: 19.02%
 Time (clock): 14:05 Room Temperature (F): 72 Initials: K

TEST FUEL

FUEL TYPE AND AMOUNT: 2 x 4 + 3 K 4 x 4 3 1 K
 CALCULATED LOAD WEIGHT: 11.2 ACTUAL LOAD WEIGHT: 6.1 (2 x 4)
4.0 (4 x 4)
10.1 Total
 FUEL PIECE LENGTH: 16.0"

MOISTURE CONTENT (METER -- DRY BASIS)

PIECE	READINGS			TYPE
1	<u>21.3</u>	<u>19.1</u>	<u>20.0</u>	<u>4x4</u>
2	<u>18.8</u>	<u>19.4</u>	<u>18.9</u>	<u>2x4</u>
3	<u>18.8</u>	<u>19.6</u>	<u>19.3</u>	<u>2x4</u>
4	<u>21.6</u>	<u>21.3</u>	<u>22.4</u>	<u>2x4</u>
5				
6				
7				
8				
9				
10				

OVERALL TEST FUEL LOAD MOISTURE AVERAGE: 20.04%
 Time (clock): 14:15 Room Temperature (F): 73 Initials: K

Technician signature: K. Morgan Date: 6-11-04

Run Notes

Client/Model: CFM
 Model: Small Dutch West
 Project #: 259-S-04-3
 Tracking Number: 642
 Run #: 7 Date: 6-11-04
 Test Crew: K Morgan, R Sparwasser
 OMNI Equipment ID Numbers: _____

PREBURN

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

PRIMARY:

Fully OPEN
~ 80°

SECONDARY: Fixed

TERTIARY: NA

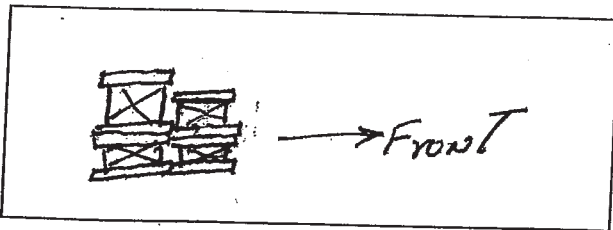
FAN: ON High

PREBURN SETTINGS AND ACTIVITIES

TIME	AIR (THERMO) CHANGES PRIMARY/SECONDARY/TERTIARY	FAN SETTING CHANGE	ADD FUEL + WT.	ADD FUEL - WT.	RAKE COAL	COMMENT
0	Test Setting					
20					X	STIR
40					X	STIR
60					X	Level

TEST

TEST FUEL CONFIGURATION SKETCH
(INDICATE VIEW ANGLE)



START UP PROCEDURES

BYPASS: NOT USED
 FUEL LOADING: Loaded by 48XL
 DOOR: Closed by 54SEL
 PRIMARY AIR: AT Test setting
Not touched or
UTILIZED For Start-up
 OTHER: _____

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: Richard Sparwasser Date: 6-11-04

Supplemental Data EPA 5G/5H

Client: CFM

Model: Small Dutch West

Project No.: 259-504-3 Tracking No.: 642

Date: 6-11-04 Run No.: 7 Booth: _____

Test Crew: K. Morgan, RC Spanwasser Start Time: 15:58 Stop Time: 17:48

OMNI Equipment #'s: _____

Gas Analyzer Train Leak Check:

Stack:

Dilution Tunnel (Method 5G Only):

Initial: NA

Initial: NA

Final: NA

Final: NA

Calibrations: Span Gas CO₂: NA O₂: NA CO: NA CO₂(DT): NA

Time	N ₂ Span	N ₂ Span	N ₂ Span	N ₂ Span	N ₂ Span	N ₂ Span	N ₂ Span
O ₂							
CO ₂				<u>NA</u>			
CO							
CO ₂ (DT)							

Stack Diameter (inches): 6.0

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

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

Induced Draft: 0 %Smoke Capture: 100

Pitot Tube Leak Test: Pre: 0 @ 3.5" WC Post: 0 @ 3.5" WC

Flue Pipe Cleaned Prior to First Test in Series: Date: 6-07-04 Initials: RA

	Initial	Middle	Ending
Pb (in. Hg)	<u>75</u>	<u>79</u>	<u>78</u>
Room Temp (°F)	<u>29.58</u>	<u>29.58</u>	<u>29.58</u>

Technician signature: Richard Morgan Date: 6-11-04

Model: DutchWest Small
CFM US Corporation
62 Vermont Castings Road
Bethel, VT 05032

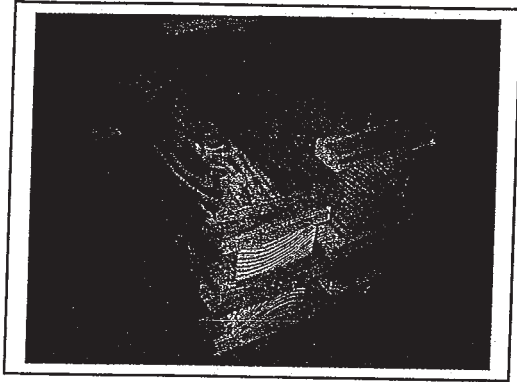
Section 3

Drawings and Fuel Photographs

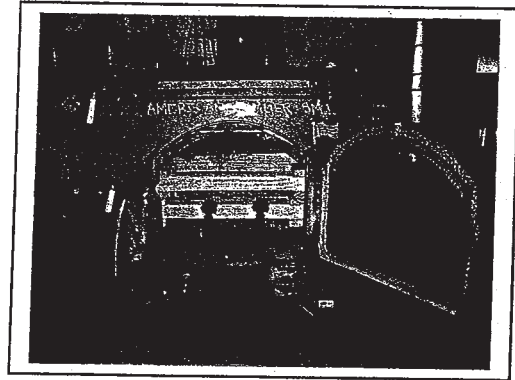
Model: DutchWest Small
CFM US Corporation
62 Vermont Castings Road
Bethel, VT 05032

CFM US Corporation
Model: DutchWest Small

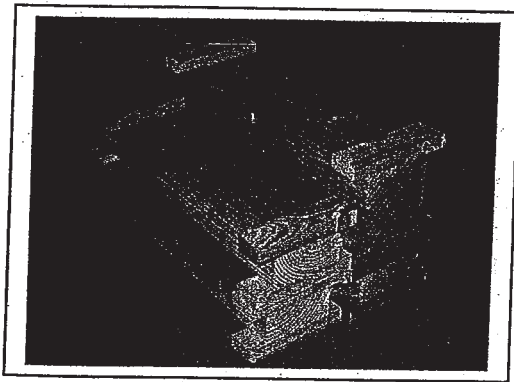
Run 1 - Fuel



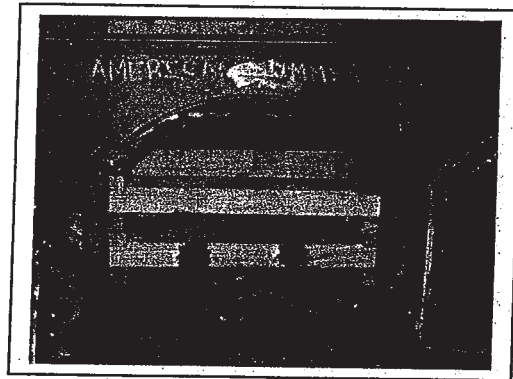
Run 1 - Newly Loaded Stove



Run 2 - Fuel



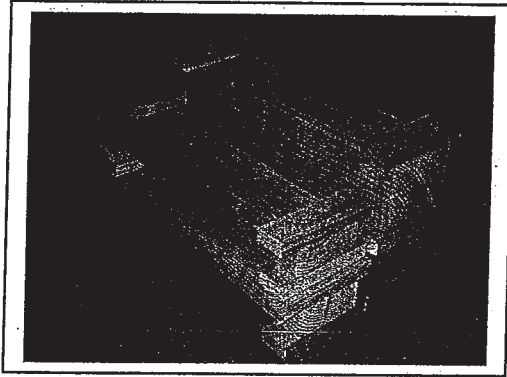
Run 2 - Newly Loaded Stove



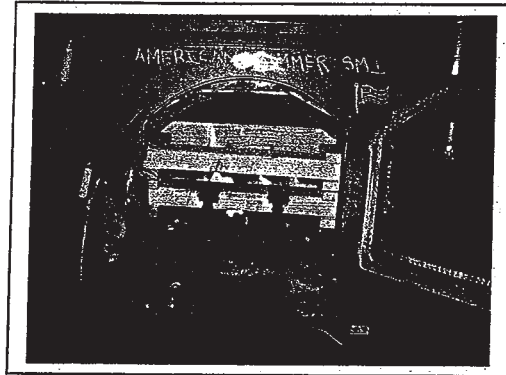
Model: DutchWest Small
CFM US Corporation
62 Vermont Castings Road
Bethel, VT 05032

CFM US Corporation
Model: DutchWest Small

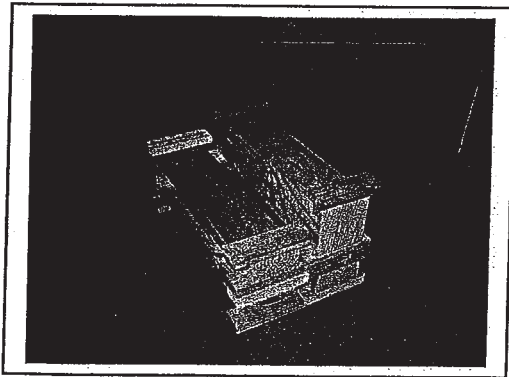
Run 3 - Fuel



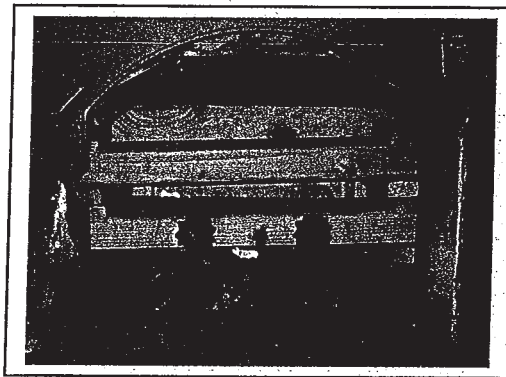
Run 3 – Newly Loaded Stove



Run 4 - Fuel



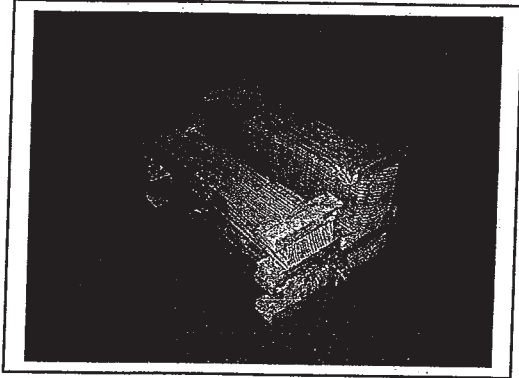
Run 4 – Newly Loaded Stove



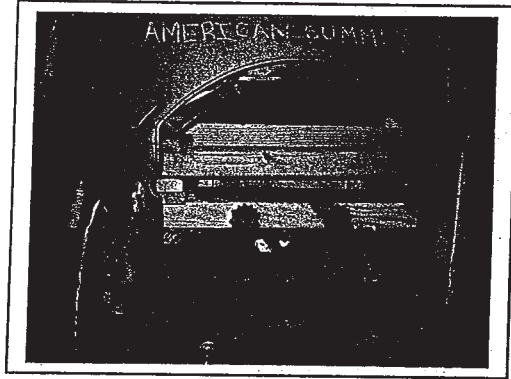
Model: DutchWest Small
CFM US Corporation
62 Vermont Castings Road
Bethel, VT 05032

CFM US Corporation
Model: DutchWest Small

Run 5 - Fuel



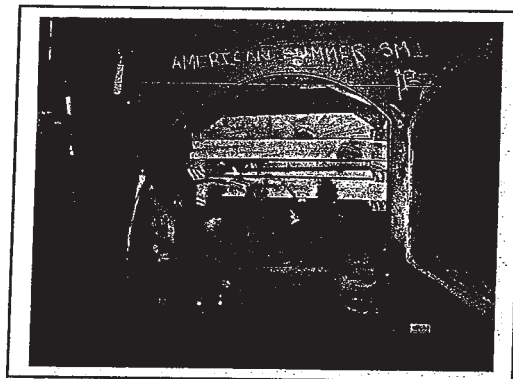
Run 5 – Newly Loaded Stove



Run 6 - Fuel



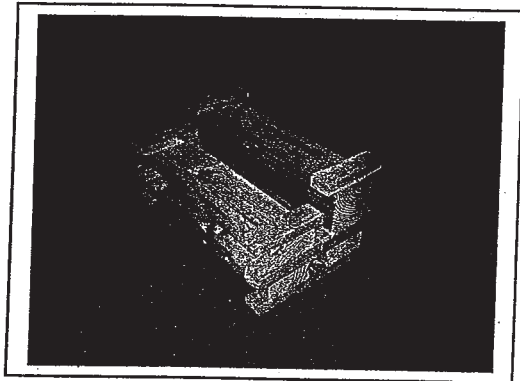
Run 6 – Newly Loaded Stove



Model: DutchWest Small
CFM US Corporation
62 Vermont Castings Road
Bethel, VT 05032

CFM US Corporation
Model: DutchWest Small

Run 7 - Fuel



Run 7 - Newly Loaded Stove

