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August 25, 2010

Letter Report No. G100187367MID-004
Project No. G100187367

Daryl Lamppa
Lamppa Manufacturing
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Tower, MN 55790

Ph: 218-753-2330
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Subject: Testing for emissions and efficiency for model VaporFire VF200 Solid Fuel Furnace.

Dear Mr. Lamppa,

This letter concludes and represents the results of the evaluation and tests of the above referenced equipment to the requirements contained in the following standards:

CAN/CSA B415.1-00 "Performance Testing of Solid-Fuel-Burning Heating Appliances"

This investigation was authorized by Daryl Lamppa, dated August 1, 2010. The sample was received on November 18, 2009 and evaluated August 4-5, 2010 at the Intertek Middleton, WI facility.

Results for efficiency and emissions for model VF200:

Test #3 high burn tested 8/4/10

	HHV Basis	LHV Basis
Overall Efficiency	76.5%	82.4%
Combustion Efficiency	99.4%	99.4%
Heat Transfer Efficiency	77%	82.8%

Output Rate (kJ/h)	42,197	40,029	(Btu/h)
Burn Rate (kg/h)	2.77	6.12	(lb/h)
Input (kJ/h)	55,178	52,343	(Btu/h)

Test Load Weight (dry kg)	11.65	25.68	dry lb
MC wet (%)	17.09		
MC dry (%)	20.61		
Particulate (g)	4.2		
CO (g)	149		
Test Duration (h)	4.20		

Emissions	Particulate	CO
g/MJ Output	0.02	0.84
g/kg Dry Fuel	0.36	12.79
g/h	1.00	35.48
lb/MM Btu Output	0.06	1.95

Air/Fuel Ratio (A/F)	14.94
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Test #4 low burn tested 8/5/10

	HHV Basis	LHV Basis
Overall Efficiency	76.2%	82.1%
Combustion Efficiency	97.0%	97.0%
Heat Transfer Efficiency	79%	84.7%

Output Rate (kJ/h)	25,709	24,388	(Btu/h)
Burn Rate (kg/h)	1.70	3.74	(lb/h)
Input (kJ/h)	33,723	31,990	(Btu/h)

Test Load Weight (dry kg)	12.44	27.41	dry lb
MC wet (%)	16.75		
MC dry (%)	20.12		
Particulate (g)	6.85		
CO (g)	608		
Test Duration (h)	7.33		

Emissions	Particulate	CO
g/MJ Output	0.04	3.23
g/kg Dry Fuel	0.55	48.91
g/h	0.93	82.94
lb/MM Btu Output	0.08	7.50

Air/Fuel Ratio (A/F)	18.71
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This is a report for our evaluation completed by Intertek on August 5, 2010 for Project No. G100187367.

If there are any questions regarding the results contained in this report, or any of the other services offered by Intertek, please do not hesitate to contact the undersigned.

Please note; this Letter Report does not represent authorization for the use of any Intertek certification marks.

Completed by: Title:	Emily Tucker Test Engineer	Reviewed by: Title:	Brian Ziegler Engineering Team Leader
Signature: Date	 August 25, 2010	Signature Date:	 August 25, 2010

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