

# Certification Test Report

Sherwood Industries Ltd.  
Freestanding Pellet Stove  
Model: Meridian

Prepared for: Sherwood Industries Ltd.  
6782 Oldfield Road  
Saanichton, BC V8M 2A3  
CANADA

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Test Period: April 16-17, 2009

Report Date: April 2009

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## **Section 5**

### **Sampling Procedures and Test Results**

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## INTRODUCTION

Sherwood Industries Ltd. retained OMNI-Test Laboratories, Inc. (*OMNI*) to perform U.S. Environmental Protection Agency (EPA) certification testing on the Meridian. The Meridian is a freestanding, pellet-fired room heater.

The testing was performed at *OMNI*'s testing facility in Portland, Oregon. The altitude of the laboratory is 30 feet above sea level. The unit was received in good condition and logged in at the *OMNI*'s testing facility on March 24, 2009. It was assigned and labeled with *OMNI* ID #1404. *OMNI* representative Ken Morgan conducted the certification testing and completed all testing by April 17, 2009. A testing contract, including provisions for Random Compliance Audit (RCA) testing, has been signed by Brian Drescher of Sherwood Industries Ltd. and is on file at *OMNI*.

The Meridian was tested in accordance with the U.S. EPA 40 CFR Part 60, Subpart AAA – Standard of Performance for Residential Wood Heaters (Appendix A, Methods 28 and 5G). Particulate emissions were measured using a Method 5G sampling train consisting of two filters (front and back). The weighted average emissions of the four test runs indicate a particulate emission level of 1.1 g/hr. Test runs were conducted in each of three burn rate categories (0.80-1.25 kg/hr; 1.25-1.90 kg/hr; and maximum). Emissions for each of the individual test runs did not exceed the cap. The Meridian results are within the emission limit of 7.5 g/hr for non-catalytic affected facilities manufactured on or after July 1, 1990, or sold at retail on or after July 1, 1992.

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

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**Table 1.1 – Particulate Emissions**

Run	Burn Rate (kg/hr dry)	Method 5G Emissions (g/hr)
1	0.81	0.87
2	1.46	0.84
3	2.24	1.95
4	1.14	1.25
Weighted particulate emission average of four test runs: 1.1 g/hr		

**Table 1.2 – Test Facility Conditions**

Run	Room Temperature (°F)		Barometric Pressure (Hg)		Air Velocity (ft/min)	
	Before	After	Before	After	Before	After
1	69	71	30.43	30.41	<50	<50
2	70	69	30.40	30.36	<50	<50
3	73	74	30.40	30.41	<50	<50
4	72	70	30.41	30.43	<50	<50

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**Table 1.3.1 – Fuel Measurement Summary – PRETEST**

Run	Beginning Fuel Weight (lbs)	Ending Fuel Weight (lbs)
1	38.6	36.9
2	31.7	29.1
3	17.6	13.4
4	14.9	12.5

**Table 1.3.2 – Fuel Measurement Summary – TEST**

Run	Beginning Fuel Weight (lbs)	Fuel Moisture Content (Dry basis - %)	Ending Fuel Weight (lbs)
1	36.9	1.3	33.3
2	28.3	1.3	21.8
3	13.3	1.3	3.3
4	12.5	1.3	7.4

**Table 1.4 – Dilution Tunnel Gas Measurements and Sampling Data Summary**

Run	Length of Test (min)	Average Dilution Tunnel Gas Measurements		
		Velocity (ft/sec)	Flow Rate (dscf/min)	Temperature (°F)
1	120	13.34	146.8	93.0
2	120	13.55	139.5	124.7
3	120	14.09	146.5	126.4
4	120	13.02	137.9	110.3

**Table 1.5 - Heater Operation Data (Average Temperature Data)**

Run	Beginning Surface Temperature Average <sup>a</sup>	Ending Surface Temperature Average <sup>a</sup>	Surface Delta T <sup>b</sup>
1	194.1	197.0	3
2	212.1	220.1	8
3	304.2	307.6	3
4	216.0	210.1	6

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

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**Table 1.6 – Pretest Configuration**

Run	Stove Temperature Control	Feed Adjuster	Temperature Control	Time (min)
1	Setting 1 of 5	N/A	N/A	65
2	Setting 3 of 5	N/A	N/A	60
3	Setting 5 of 5	N/A	N/A	60
4	Setting 2 of 5	N/A	N/A	66

**Table 1.7 – Test Configuration**

Run	Stove Temperature Control	Feed Adjuster	Temperature Control	Time (min)
1	Setting 1 of 5	N/A	N/A	120
2	Setting 3 of 5	N/A	N/A	120
3	Setting 5 of 5	N/A	N/A	120
4	Setting 2 of 5	N/A	N/A	120

Table 1.8 – Run Data

Run	Average Dry Burn Rate (kg/hr)	Initial (Induced) Draft (in H <sub>2</sub> O)	Average Draft (in H <sub>2</sub> O)	Run Time (min)
1	0.81	0	-0.04	120
2	1.46	0	-0.03	120
3	2.24	0	-0.05	120
4	1.14	0	-0.04	120

## TEST RESULTS AND DISCUSSION

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

The weighted particulate emission level was measured to be 1.1 g/hr.

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