

# CERTIFICATION OF CONFORMITY

## Models:

**Chatham-1, EF2-1, Davenport-1, Kinderhook-1**

Effective Date: August 19, 2016  
Project: 0268PS024.REV001  
Issued to: Sherwood Industries  
6782 Oldfield Road  
Saanichton, British Columbia V8M 2A3  
Canada


### **OMNI-Test Laboratories, Inc. certifies that:**

- The above-named appliance has been tested by a laboratory qualified to test and report on the emissions of this type of product under 40 CFR Part 60, Standards of Performance for New Residential Wood Heaters, New Residential Hydronic Heaters and Forced-Air Furnaces.
- The Test Report No. 0268PS024.REV001, written by OMNI-Test Laboratories, Inc. and dated August 2016, has been reviewed by OMNI-Test Laboratories, Inc. and was found to be complete and to have used the correct procedures.
- The emissions levels measured in the Test Report comply with the 2015 particulate matter limit of 4.5 g/hr. The emission rate measured for this appliance was 1.44 g/hr.
- The models listed above were tested to ASTM 2779 and ASTM 2515.
- The permanent label and owner's manual meet the requirements of 40 CFR § 60.536.
- The above-named manufacturer, on the effective date of this certificate, was operating under a quality assurance plan that has been reviewed and approved by OMNI-Test Laboratories, Inc.
- The above-named manufacturer has contracted OMNI-Test Laboratories, Inc. to conduct regular (at least annual) unannounced audits of the manufacturing facility, appliance, and quality assurance plan.

The models listed above are eligible to bear the mark shown.



Issued by: OMNI-Test Laboratories, Inc.  
13327 NE Airport Way  
Portland, Oregon 97230

  
\_\_\_\_\_  
Alex Tiegs, President

**A current Product Documentation and Listing Agreement is required to maintain appliance listing.**

The product certification system operated by OMNI-Test Laboratories, Inc. most closely resembles that described by ISO/IEC Guide 67, System 5. OMNI-Test Laboratories, Inc. is accredited by the Standards Council of Canada and the American National Standards Institute as a certification organization.

# **Non-Confidential Business Information (Non-CBI) Certification Test Report**

## **Sherwood Industries Freestanding Pellet Stove Model: Chatham-1**

**Prepared for:** Sherwood Industries  
6782 Oldfield Road  
Saanichton, British Columbia V8M 2A3  
Canada

**Prepared by:** OMNI-Test Laboratories, Inc.  
13327 NE Airport Way  
Portland, OR 97230  
(503) 643-3788

**Test Period:** July 15, 2016

**Report Date:** August 3, 2016

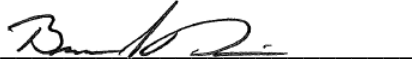
**Report Number:** 0268PS024E.REV001

*All data and information contained in this report are confidential and proprietary to Sherwood Industries. Its significance is subject to the adequacy and representative character of the samples and to the comprehensiveness of the tests, examinations, or surveys made. The contents of this report cannot be copied or quoted, except in full, without specific, written authorization from Sherwood Industries and OMNI-Test Laboratories, Inc. No use of the OMNI-Test Laboratories, Inc. name, logo, or registered mark (O-TL) is permitted, except as expressly authorized by OMNI-Test Laboratories, Inc. in writing.*

## **AUTHORIZED SIGNATORIES**

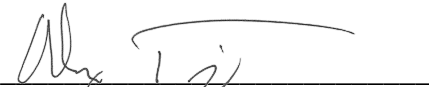
This report has been reviewed and approved by the following authorized signatories:

### **Technician:**



Bruce Davis, Technician  
OMNI-Test Laboratories, Inc.

### **QA Review:**



Alex Tiegs, QA Administrator  
OMNI-Test Laboratories, Inc.

### **Evaluation Decision:**



Sebastian Button, Testing Supervisor  
OMNI-Test Laboratories, Inc.

August 16, 2016  
Issue Date

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*Model: Chatham-1  
Sherwood Industries  
6782 Oldfield Road  
Saanichton, British Columbia V8M 2A3*

# **Section 1**

## **Sampling Procedures and Test Results**

## **INTRODUCTION**

Sherwood Industries retained OMNI-Test Laboratories, Inc. (*OMNI*) to perform U.S. Environmental Protection Agency (EPA) certification testing on the Chatham-1 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 June 6, 2016. It was assigned and labeled with *OMNI* ID #2205. *OMNI* representative Bruce Davis conducted the certification testing and completed all testing by July 15, 2016.

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

## **SAMPLING PROCEDURE**

The Chatham-1 was tested in accordance with the U.S. EPA 40 CFR Part 60, Subpart AAA – Standards of Performance for New Residential Wood Heaters using ASTM E2515 and ASTM E2779. The fuel used for certification testing was Lignetics hardwood pellet fuel; this fuel was graded as Premium by the Pellet Fuels Institute and was produced at registered mill #03434. Particulate emissions were measured using dual sampling trains consisting of two sets of filters (front and back). The results of the integrated test run indicate an average particulate emission rate of 1.44 g/hr. The Chatham-1 results are within the emission limit of 4.5 g/hr for affected facilities manufactured on or after May 15, 2015, or sold at retail after December 31, 2015.

The model Chatham-1 was tested for thermal efficiency and carbon monoxide (CO) emissions in accordance with CSA B415.1-10. The heater has a demonstrated an average thermal efficiency of 76.7%. The calculated CO emission rate was 7.41 g/hr.

## **RUN DISCUSSION**

**Run 1** was an attempt at an integrated test run consisting of burn settings that result in 60 +5/-0 minutes at maximum, 120 +5/-0 minutes at medium (<50% of maximum), and 180 +5/-0 minutes at minimum. Each burn category in this run was achieved, meeting both time and burn rate requirements. No sampling anomalies occurred, so this integrated test run is acceptable per ASTM E2779 and no further test runs were needed.

## **SUMMARY OF RESULTS**

The average particulate emission rate over the complete, integrated test run was measured to be 1.44 g/hr.

The average particulate emission factor for the complete, integrated test run was measured to be 1.46 g/dry kg of fuel.

The average thermal efficiency for the complete, integrated test run was measured to be 76.7%.

The particulate emission rate calculated from the one-hour filter was 3.61 g/hr.

The proportionality results and sample train agreement for the test run was acceptable. Quality check results for each test run are presented in Section 3 of this report.

**Table 1.1 – Particulate Emissions**

	<b>One-Hour Filter</b>	<b>Integrated Total</b>
<b>Emission Rate (g/hr)</b>	3.61	1.44
<b>Emission Factor (g/dry kg)</b>	1.63	1.46

**Table 1.2 – Efficiency and CO**

	<b>Burn Rate Segment</b>			<b>Integrated Total</b>
	<b>Maximum</b>	<b>Medium</b>	<b>Minimum</b>	
<b>Time (minutes)</b>	60	120	180	360
<b>Burn Rate (dry kg/hr)</b>	2.21	0.95	0.61	0.99
<b>Heat Input Rate (BTU/hr, HHV)</b>	40,852	17,622	11,214	18,290
<b>Heat Output Rate (BTU/hr, HHV)</b>	32,134	12,655	8,852	14,033
<b>Efficiency (% , HHV)</b>	78.7%	71.8%	78.9%	76.7%
<b>Efficiency (% , LHV)</b>	84.2%	76.9%	84.5%	82.1%
<b>CO Emission Rate (g/hr)</b>	22.0	8.4	2.3	7.4



**Table 1.3 – Test Facility Conditions**

	<b>Initial</b>	<b>Middle</b>	<b>Final</b>
<b>Room Temperature</b> (°F)	75	75	78
<b>Barometric Pressure</b> (in Hg)	30.24	30.23	30.22
<b>Air Velocity</b> (ft/min)	< 50	< 50	< 50
<b>Induced Draft</b> (in H <sub>2</sub> O)	0	0	0

**Table 1.4 – Fuel Measurement Summary**

<b>Segment</b>	<b>Time</b> (min)	<b>Burn Rate</b> (dry kg/hr)	<b>Consumed Fuel Weight</b> (lbs)	<b>Fuel Moisture Content</b> (dry basis - %)
Pretest	60	2.21	5.1	4.735
Maximum	60	2.21	5.1	4.735
Medium	120	0.95	4.4	4.735
Minimum	180	0.61	4.2	4.735
Integrated Total	360	0.99	13.7	4.735

**Table 1.5 – Dilution Tunnel and Flue Gas Measurements**

Segment	Average Flue Draft (in H <sub>2</sub> O)	Average Dilution Tunnel Gas Measurements		
		Velocity (ft/sec)	Flow Rate (dscf/min)	Temperature (°F)
Integrated Total	-0.029	17.51	196.6	88.2

**Table 1.6 – Heater Configuration**

Segment	Heat Level	Feed Trim	Combustion trim	Manual air Slide
Pretest	5	5	2	Full Closed
Maximum	5	5	2	Full Closed
Medium	2	2	2	Full Closed
Minimum	1	1	2	Full Closed