TEST REPORT

Intertek ETL SEMKO

REPORT NUMBER: 3118026
ORIGINAL ISSUE DATE: MAY 30, 2007
REVISED ISSUE DATE: JUNE 26, 2007
REVISION #2 ISSUE DATE: JULY 12, 2007

EVALUATION CENTER
Intertek Testing Services NA Inc.
8431 Murphy Drive
Middleton, WI 53562

RENDERED TO

BIOMASS COMBUSTION SYSTEMS, INC.
67 MILLBROOK STREET, SUITE 505
WORCESTER, MA 01606

PRODUCT EVALUATED: Model 36" Shop Heater Solid Fuel Central Furnace

Report of Testing Model 36" Shop Heater Solid Fuel Central Furnace for compliance with the applicable requirements of the following criteria: UL 391-06 "Solid-Fuel and Combination-Fuel Central and Supplementary Furnaces", and CSA B366.1-M91 "Solid-Fuel-Fired Central Heating Appliances".

1 Table of Contents

2 Introduction

Intertek Testing Services NA (Intertek) has conducted testing for Biomass Combustion Systems, Inc., on model 36" Shop Heater Solid Fuel Central Furnace, to evaluate all applicable performance requirements included in UL 391-06 "Solid-Fuel and Combination-Fuel Central and Supplementary Furnaces", and CSA B366.1-M91 "Solid-Fuel-Fired Central Heating Appliances". This evaluation began May 22, 2007 and was completed May 25, 2007.

3 Test Samples

3.1. SAMPLE SELECTION

A sample was reviewed by Intertek at an end consumer's facility in Clare, MI. The sample was not independently selected for testing. The sample was reviewed on May 22, 2007

3.2. SAMPLE AND ASSEMBLY DESCRIPTION

The model 36" Shop Heater Solid Fuel Central Furnace is constructed of carbon steel. The outer dimensions are 88-inches long, 104-inches high, and 48-inches wide. The firebox is located beneath the heat exchanger with a 13-inch flue opening located at the top front of the outer casing. A 30-inch opening for outlet air is at the top center of the outer casing, above the heat exchanger.

4 Testing and Evaluation Methods

4.1. TEST STANDARD 1

UL 391-06 "Solid-Fuel and Combination-Fuel Central and Supplementary Furnaces"

May 22, 2007, set-up was completed and tests were started. Testing began with a normal operation test burning kiln dried spruce, pine, fir construction lumber. The outlet air was restricted to establish maximum operating static pressure. The fuel door handle exceeded the temperature limit of 122^{O}F with a temperature of 196^{O}F.

May 23, 2007, the unit was restarted and operated to fully heated condition with kiln dried spruce, pine, fir construction lumber. When the unit was at stable temperatures, the power was disrupted. The unit shut down and started to cool. The unit was restarted and operated to stable. When stable, the inlet air was restricted until the limit control functioned. Outlet air was at 199^{O}F when limit cut out. The unit was again refired and operated to stable. When stable, the circulation blower was disrupted. The limit control functioned within 5 seconds of blower being disrupted. The unit was operated to stable and the outlet air was blocked. The limit control functioned allowing the unit to cool.

4.1.1. Deviation from Standard Method

No deviations from the standard were performed, however, only the applicable sections from the standard was used during all testing.

4.2 TEST STANDARD 2

CSA B366.1-M91 "Solid-Fuel-Fired Central Heating Appliances"

Test methods from test standard 1 are deemed to follow similar procedures outlined in test standard 2. No further testing is required for acceptance of test standard 2.

4.2.1 Deviation from Standard Method

No deviations from the standard were performed, however, only the applicable sections from the standard was used during all testing.

5 Testing and Evaluation Results

5.1. RESULTS AND OBSERVATIONS

Based on all testing that was performed, the following results have been recorded:

- Maximum static pressure in the plenum – 0.32-inches of water column
- Fuel door handle must be removable and not attached to the unit during operation
- Maximum setting on limit switch – 200^{O}F
- Minimum clearances to combustibles –
  Unit to backwall = 36-inches
  Unit to sidewall = 14-inches
  Plenum to ceiling = 12-inches

6 Conclusion

The Model 36" Shop Heater Solid Fuel Central Furnace has been found to be in compliance with the applicable performance and construction requirements of the following criteria: UL 391-06 "Solid-Fuel and Combination-Fuel Central and Supplementary Furnaces", and CSA B366.1-M91 "Solid-Fuel-Fired Central Heating Appliances". Based on tests performed on model 36" Shop Heater, smaller and similar model 30" Shop Heater is also found to be acceptable under this test report when installed and operated under the same requirements as model 36" Shop Heater.

The conclusions of this test report may be used as part of the requirements for Intertek product certification. Authority to Mark must be issued for a product to become certified.

INTERTEK TESTING SERVICES NA

Evaluated by: _____
Edwin Hodgson
Technician - Hearth

Reviewed by: _____
Brian Ziegler
Engineering Team Leader - Hearth