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**THERMAL CLEARANCE TESTING OF THE VISIONLINE  
PHOENIX FREE-STANDING APPLIANCE**

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|          |           |   |

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## THERMAL CLEARANCE TESTING OF THE VISIONLINE PHOENIX FREE-STANDING APPLIANCE

### Report

The VisionLINE Phoenix Free-Standing appliance installed with a VisionLINE Default 6” Flue Kit with 8” decromesh casing was tested in two positions in a manner conforming to joint Australian/New Zealand Standard 2918:2018, Appendix B.

A minimum 870mm deep x 930mm wide x 6mm thick floor protector (compressed board) should be used under and in front of the appliance base when installing the appliance (see joint AS/NZS 2918:2018 3.3.2). The floor protector should extend 300mm in front of the appliance door and be placed centrally in the 930mm width. The Thermal resistivity of the floor protector is 0.026m<sup>2</sup>.K/W for 6mm thick compressed board sheets.

The VisionLINE Phoenix Free-Standing solid fuel appliance installed with a VisionLINE Default 6” Flue Kit with 8” decromesh casing conforms to the requirements of the joint AS/NZS 2918:2018 Standard, Appendix B.

The appliance and flue system were tested at the following clearances:

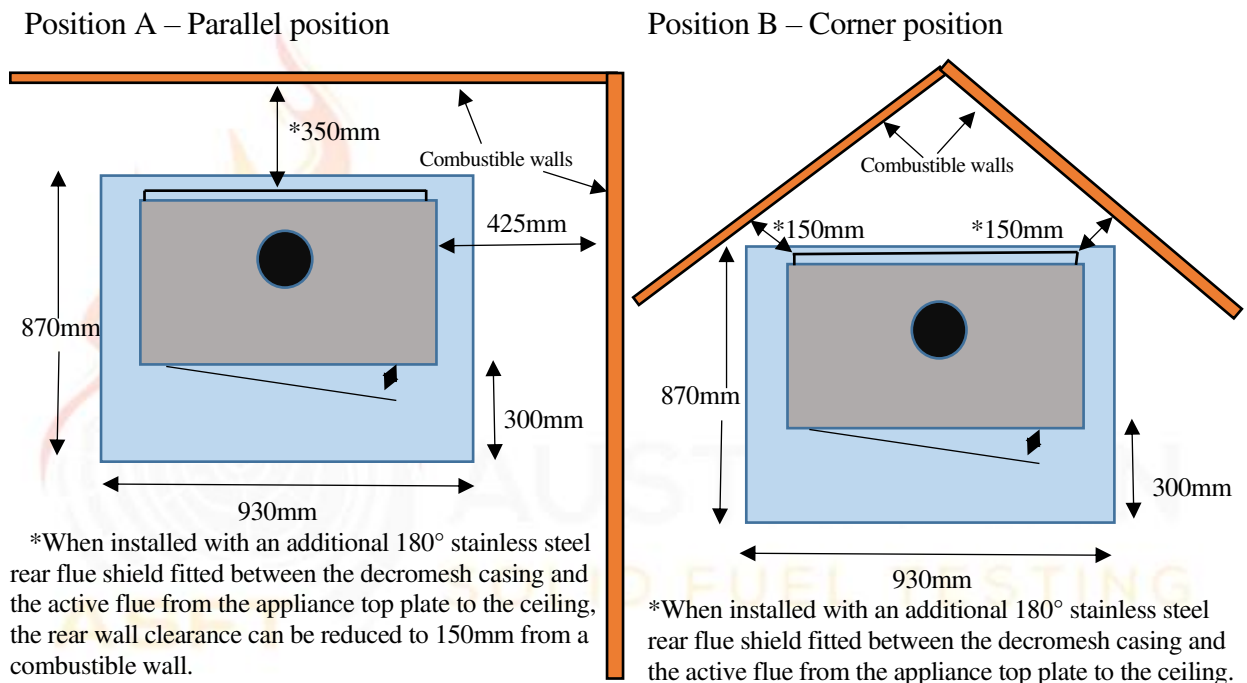


Figure 1 – Clearance Diagram

|               |                          |                 |  |
|---------------|--------------------------|-----------------|--|
| <b>Signed</b> |                          | <b>Approved</b> |  |
| <b>Name</b>   | Garry W. Mooney          | <b>Name</b>     | Steve Marland  |
| <b>Title</b>  | <i>Technical Officer</i> | <b>Title</b>    | <i>Managing Director – Australian Solid Fuel Testing</i> |
| <b>Date</b>   | 6/10/2021                | <b>Date</b>     | 6/10/2021  |

## 1. INTRODUCTION

Thermal Clearance testing of the Appliance and flue system took place on 1 and 4 October 2021 at the Australian Solid Fuel Testing Laboratory located at 3 Garden Street, Morwell, Victoria. The testing was performed by Mr G.W. Mooney and Mr S. Marland.

## 2. PROCEDURE

Testing was conducted as per Appendix B of AS/NZS2918;2018, Hot sites were located with the aid of an infra-red thermometer. Thermocouple tips were stapled onto the test surfaces, with black tape over the first 100 mm to facilitate consistent and accurate recording of temperatures.

Thermocouple positions are shown in the table below:

### Position A – Parallel Position

| Thermocouple No. | Position                          | Thermocouple No. | Position  |
|------------------|-----------------------------------|------------------|---|
| 1                | Floor - 1300mm in front of centre | 16               | Floor – 150mm RHS of centre                           |
| 2                | Floor – 1200mm in front of centre | 17               | Floor – 300mm RHS of centre                           |
| 3                | Floor - 1050mm in front of centre | 18               | Floor – 450mm RHS of centre                           |
| 4                | Floor – 900mm in front of centre  | 19               | Ceiling Ring – Inner side                             |
| 5                | Floor – 750mm in front of centre  | 20               | Ceiling Ring – 25mm to side                           |
| 6                | Floor – 600mm in front of centre  | 21               | Ceiling Ring – Inner front                            |
| 7                | Floor – 450mm in front of centre  | 22               | Ceiling Ring – 25mm in front                          |
| 8                | Floor – 300mm in front of centre  | 23               | Rear wall – 808mm from corner, 2149mm above the floor |
| 9                | Floor – 150mm in front of centre  | 24               | Rear wall – 863mm from corner, 2176mm above the floor |
| 10               | Floor – Centre of flue            | 25               | Rear wall – 564mm from corner, 1158mm above the floor |
| 11               | Floor – 150mm behind centre       | 26               | RHS wall, 516mm from corner, 1206mm above the floor   |
| 12               | Floor – 300mm behind centre       | 27               | RHS wall, 615mm from corner, 1194mm above the floor   |
| 13               | Floor – 450mm LHS of centre       | 28               | RHS wall, 1355mm from corner, 771mm above the floor   |
| 14               | Floor – 300mm LHS of centre       | 29               | Rear wall – 752mm from corner, 1094mm above the floor |
| 15               | Floor – 150mm LHS of centre       | 30               | Ambient temperature                                   |

### Position B – Corner Position

| Thermocouple No. | Position   | Thermocouple No. | Position  |
|------------------|--|------------------|---|
| 19               | Ceiling Ring – Inner side                            | 25               | LHS wall – 665mm from corner, 753mm above the floor |
| 20               | Ceiling Ring – 25mm to                               | 26               | RHS wall, 784mm from corner, 827mm above the floor  |
| 21               | Ceiling Ring – Inner front                           | 27               | RHS wall, 618mm from corner, 1204mm above the floor |
| 22               | Ceiling Ring – 25mm in front                         | 28               | RHS wall, 581mm from corner, 822mm above the floor  |
| 23               | LHS wall – 804mm from corner, 2130mm above the floor | 29               | LHS wall, 696mm from corner, 1063mm above the floor |
| 24               | LHS wall – 537mm from corner, 1110mm above the floor | 30               | Ambient temperature                                 |

TABLE 1

### **3. TEST FUEL**

Testing was conducted with Pinus Radiata as the test fuel which had a moisture content of 12.7% moisture. Each firewood piece was 300mm x 75mm x 45mm.

### **4. FLUE SYSTEM**

The flue system used during testing was a VisionLINE Default 6" Flue Kit with 8" decromesh casing was supplied by VisionLINE Flue Systems. This flue system has not been tested to joint AS/NZS 2918:2018, Appendix F. The flue height was  $4.6 \pm 0.1$ m from the floor protector. Appendix 1 shows details of the flue system.

### **5. RESULTS**

#### **5.1 High Fire Test**

The appliance was fired in accordance with Section B9.1 of AS/NZS2918;2018. The level of fuel was maintained between 50-75% of the full volume level of the fuel chamber during the High Fire test.

The average fuel load for initiating the High Fire tests was 8.6kg with an average refuelling rate of 1.6kg/10 minutes.

During High Fire testing it was found that the highest surface temperatures occurred when the primary air control and the baffle by-pass of the appliance was fully open.

#### **5.2 Flash Fire Test**

Immediately after the High Fire test was completed, sufficient embers were removed to bring the fire bed to a level of 15-25% of the fuel chamber volume. The appliance was then fired in accordance with Section B9.2 of AS/NZS2918;2018.

The average fuel load for initiating the Flash Fire tests was 7.1kg.

The highest temperature rises were achieved by leaving the main door resting against the door catch with the primary air and the baffle by-pass fully open.

### 5.3 Ambient and Test Surface Temperatures

The Tables below show the Ambient temperatures and test surfaces temperatures during testing of the appliance and flue combination:

#### *Ambient Temperature Range °C*

| Position | High Fire   | Flash Fire  |
|----------|-------------|-------------|
| A        | 15.7 – 25.6 | 22.6 – 25.5 |
| B        | 20.2 – 24.2 | 19.9 – 24.6 |

#### *Maximum Surface Temperature Rise above Ambient - Position A*

| Position  | Thermocouple Number | High Fire Test (°C) | Thermocouple Number | Flash Fire Test (°C) |
|-----------|---------------------|---------------------|---------------------|----------------------|
| Floor     | 4                   | 48.1                | 4                   | 51.4                 |
| Ceiling   | 22                  | 62.8                | 22                  | 84.2                 |
| Rear Wall | 29                  | 62.5                | 29                  | 77.5                 |
| Side Wall | 28                  | 60.8                | 27                  | 67.3                 |

#### *Maximum Surface Temperature Rise above Ambient - Position B*

| Position | Thermocouple Number | High Fire Test (°C) | Thermocouple Number | Flash Fire Test (°C) |
|----------|---------------------|---------------------|---------------------|----------------------|
| Ceiling  | 20                  | 84.0                | 20                  | 84.9                 |
| RHS Wall | 27                  | 60.6                | 27                  | 72.2                 |
| LHS Wall | 29                  | 60.6                | 29                  | 67.7                 |

### 5.4 Uncertainty of Measurement Statement

- 5.5.1 The uncertainty of distance measurement for determining clearance distances was not greater than  $\pm 3$ mm.
- 5.5.2 The uncertainty of temperature measurement during the entire test period was a maximum of  $\pm 2^\circ\text{C}$  at a 95% confidence level.

## 6. APPLIANCE CONSTRUCTION DETAILS

The test results reported directly relate to the appliance/flue system tested. The details of the appliance given in this section include features which may affect safety clearances. Any change in the design/construction of this appliance or flue may invalidate this report. Below are the constructions details of the appliance:

|  |                               |                                 |
|--|-------------------------------|---------------------------------|
| Appliance Model Name: <b>VisionLINE Phoenix</b>  |                               | Serial No: <b>N/A</b>           |
| Manufacturer: <b>Jetmaster (Vic) Pty Ltd</b>   |                               |                                 |
| Overall Height: <b>922mm</b>   | Overall Depth: <b>570mm</b>   | Overall Width: <b>690mm</b>     |
| Top Plate Width: <b>690mm</b>  | Top Plate Depth: <b>570mm</b> | Top Plate Thickness: <b>6mm</b> |
| Appliance pedestal Height: <b>387mm</b>  | Depth: <b>570mm</b>           | Width: <b>690mm</b>             |
| Usable Firebox Height: <b>310mm</b>  | Width: <b>557mm</b>           | Depth: <b>391mm</b>             |
| Usable Firebox Volume: <b>67.51 Litres</b>   |                               |                                 |
| Firebox Material Type/Seam Fully Welded: <b>Fully welded 5mm steel</b>   |                               |                                 |
| Firebrick Type: <b>Fully lined Ceramic</b>   |                               |                                 |
| Main Door Opening Height: <b>310mm</b>   | Width: <b>530mm</b>           |                                 |
| Door Height: <b>470mm</b>  | Width: <b>650mm</b>           | Depth: <b>45mm</b>              |
| Door glass Height: <b>450mm</b>  | Width: <b>645mm</b>           |                                 |
| Primary Air Location: <b>Below firebox at front</b>  |                               |                                 |
| Dimension of Primary Air: <b>2 slots @ 60×35mm deep + 2 slots @ 60×19mm deep. 2 D shapes slots 9mm long × 8mm wide when fully closed. 2 slots 60×3mm deep + 2 D shapes slots 12mm long × 8mm wide when set to 3mm open</b> |                               |                                 |
| Area of Primary (mm <sup>2</sup> ): <b>4,200 + 2,280 = 6,480mm<sup>2</sup></b>   |                               |                                 |
| Secondary/Tertiary Air Location: <b>2 slots each side of firebox 255mm below baffle</b>  |                               |                                 |
| Dimension of Secondary/Tertiary Air: <b>4 slots @ 70mm long × 7mm</b>  |                               |                                 |
| Area of Secondary/Tertiary Air (mm <sup>2</sup> ): <b>1,960mm<sup>2</sup></b>  |                               |                                 |
| Baffle Plate size: <b>340×620×30mm</b>   |                               |                                 |
| Baffle By-pass size: <b>210×85×5mm</b>   |                               |                                 |
| Flue Dimensions: <b>152mm</b>  |                               |                                 |
| Spigot Dimensions:   | OD: <b>145mm</b>              | ID: <b>135mm</b>                |
| Spigot to Rear of Appliance: <b>130mm</b>  |                               |                                 |
| Rear Internal to External Heat Shield: <b>15mm</b>   |                               |                                 |
| Firebox to Side External Heat Shield: <b>25mm</b>  |                               |                                 |
| Heat Shield Material Type: <b>Sides 6mm steel, Rear 2mm steel</b>  |                               |                                 |
| Additional Rear Heat Shield: <b>635×500×1.2mm</b>  |                               |                                 |
| Additional Rear Heat Shield Internal to External Heat Shield: <b>15-60mm</b>   |                               |                                 |
| Water Heater Fitted: <b>No</b>   |                               |                                 |
| Fan Location/Speeds: <b>N/A</b>  |                               |                                 |
| Catalytic Combustor fitted: <b>No</b>  |                               |                                 |
| Grate: <b>No</b>   |                               |                                 |
| <b>NOTE: Accuracy of measurement is ±5% of the measured value</b>  |                               |                                 |

## 7. CONCLUSION

The VisionLINE Phoenix Free-Standing appliance installed with a VisionLINE Default 6" Flue Kit with 8" decromesh casing, conforms to the requirements of Australian/New Zealand Standard 2918:2018, with respect to floor, ceiling, side wall and rear wall surface temperatures, when tested in the test positions shown in Figure 1 of this report in accordance with Appendix B of AS/NZS2918:2018.





## APPENDIX 1:



### DEFAULT 6" FLUE KIT with mesh and solid decorative flue INSTALLATION INSTRUCTIONS

#### For connecting into a standard installation:

The following drawing is meant as a guide only. Your wood heater **must** be installed by a qualified person whose work conforms with local council regulations, Australian/New Zealand standards (AS/NZS 2918:2001) & manufacturer's recommendations.

