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**PREPARED FOR**

# **PIVOT STOVE & HEATING**



## **THERMAL CLEARANCE TESTING OF THE CHARNWOOD COVE 3 FREE-STANDING APPLIANCE WITH ROOM SEAL FLUE 8 KIT**

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## Report Distribution

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## Revision Details

Revision	Date	Comments
0	10/08/2022	Preliminary report – awaiting payment and engineering drawings of appliance
1	12/08/2022	Manufacturer name change from Pivot Stoves to Charnwood

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## THERMAL CLEARANCE TESTING OF THE CHARNWOOD COVE 3 FREE-STANDING APPLIANCE WITH ROOM SEAL FLUE 8 KIT

### Report

The Charnwood Cove 3 Free-Standing appliance installed a with Room Seal Flue 8 kit was tested in one position in a manner conforming to joint Australian/New Zealand Standard 2918:2018, Appendix B.

A minimum 910mm deep x 765mm wide x 12mm 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 450mm in front of the appliance door and be placed centrally in the 765mm width. The Thermal resistivity of the floor protector is 0.052m<sup>2</sup>.K/W for 12mm thick compressed board sheets.

The Charnwood Cove 3 Free Free-Standing solid fuel appliance installed a with Room Seal Flue 8 kit 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:

#### Position A – Parallel position

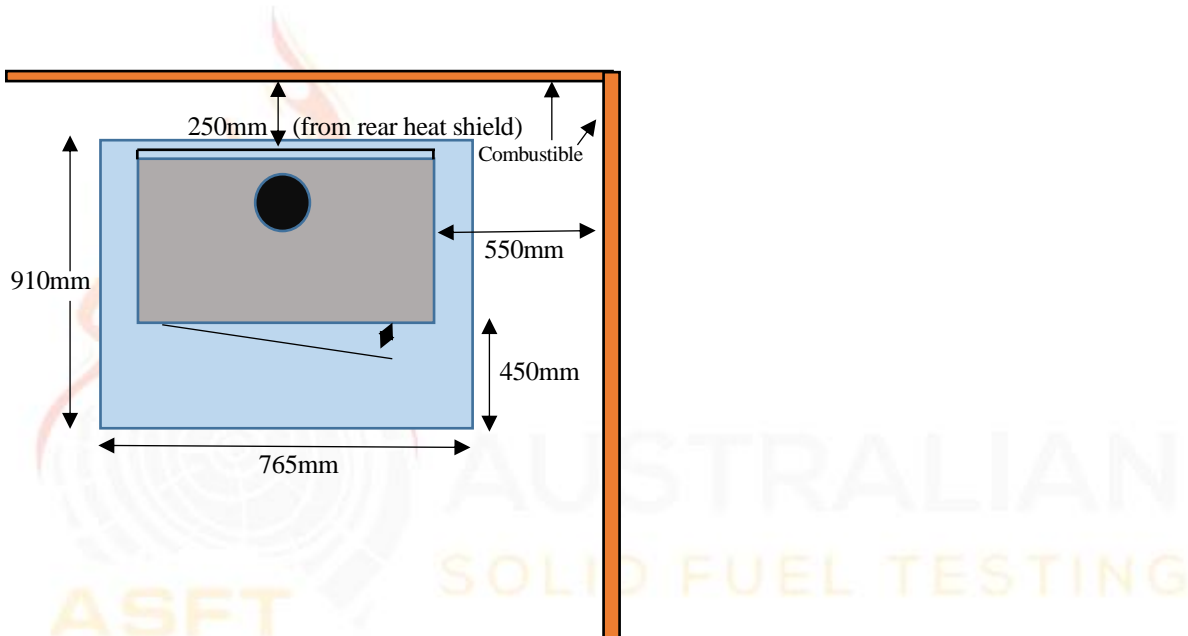




Figure 1 – Clearance Diagram

			
<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>	12/08/2022	<b>Date</b>	12/08/2022

## 1. INTRODUCTION

Thermal Clearance testing of the Appliance and flue system took place on 9 August 2022 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 front
5	Floor – 750mm in front of centre	20	Ceiling Ring – 25mm in front
6	Floor – 600mm in front of centre	21	Ceiling Ring – Inner side
7	Floor – 450mm in front of centre	22	Ceiling Ring – 25mm to side
8	Floor – 300mm in front of centre	23	Rear wall – 753mm from corner, 2155mm above the floor
9	Floor – 150mm in front of centre	24	Rear wall – 861mm from corner, 1230mm above the floor
10	Floor – Centre of flue	25	Rear wall – 891mm from corner, 847mm above the floor
11	Floor – 150mm behind centre	26	RHS wall, 914mm from corner, 698mm above the floor
12	Floor – 300mm behind centre	27	RHS wall, 393mm from corner, 1174mm above the floor
13	Floor – 450mm LHS of centre	28	RHS wall, 726mm from corner, 853mm above the floor
14	Floor – 300mm LHS of centre	29	Rear wall – 761mm from corner, 1085mm above the floor
15	Floor – 150mm LHS of centre	30	Ambient temperature

TABLE 1

## 3. TEST FUEL

Testing was conducted with Pinus Radiata as the test fuel which had a moisture content of 14.9% moisture. Each firewood piece was 195mm x 95mm x 40mm.

## 4. FLUE SYSTEM

The flue system used during testing was a Room Seal Flue 8 kit was supplied by Pivot Stoves & Heating. This flue system has 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 8.0kg with an average refuelling rate of 1.5kg/10 minutes.

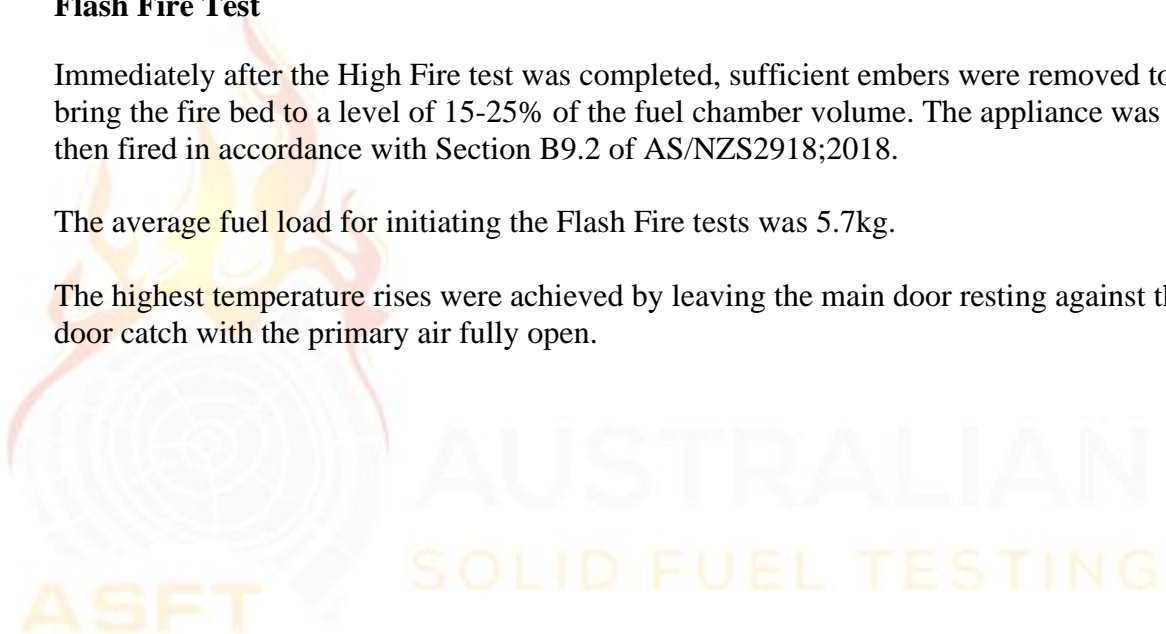
During High Fire testing it was found that the highest surface temperatures occurred when the primary air control of the appliance was fully open.

### **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 5.7kg.

The highest temperature rises were achieved by leaving the main door resting against the door catch with the primary air 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	10.2 – 26.8	20.7 – 23.8

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

Position	Thermocouple Number	High Fire Test (°C)	Thermocouple Number	Flash Fire Test (°C)
Floor	4	57.0	7	57.2
Ceiling	22	32.6	22	32.5
Rear Wall	24	59.4	24	56.6
Side Wall	26	58.8	26	59.4

### 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>Charnwood Cove 3</b>		Serial No: <b>RXE 100293</b>
Manufacturer: <b>Charnwood</b>		
Overall Height: <b>1020mm</b>	Overall Depth: <b>460mm</b>	Overall Width: <b>660mm</b>
Top Plate Width: <b>660mm</b>	Top Plate Depth: <b>405mm</b>	Top Plate Thickness: <b>10mm</b>
Appliance pedestal Height: <b>100mm</b>	Depth: <b>330mm</b>	Width: <b>578mm</b>
Usable Firebox Height: <b>530mm</b>	Width: <b>514mm</b>	Depth: <b>245-255mm</b>
Usable Firebox Volume: <b>67.72 Litres</b>		
Firebox Material Type/Seam Fully Welded: <b>Fully welded 5mm steel</b>		
Firebrick Type: <b>Compressed vermiculite, 30mm</b>		
Main Door Opening Height: <b>543mm</b>	Width: <b>365mm</b>	
Door Height: <b>770mm</b>	Width: <b>480mm</b>	Depth: <b>30mm</b>
Door glass Height: <b>465-505mm</b>	Width: <b>360mm</b>	
Primary Air Location: <b>Below firebox at rear</b>		
Dimension of Primary Air: <b>3 slots: 1 @ 120×65mm, 2 @ 65×50mm. 1 slot @ 65×15mm when fully closed</b>		
Area of Primary (mm <sup>2</sup> ): <b>7,800+6,500 = 14,300mm<sup>2</sup></b>		
Secondary/Tertiary Air Location: <b>Rear of firebox 235mm below baffle</b>		
Dimension of Secondary/Tertiary Air: <b>10 holes @ 5mm</b>		
Area of Secondary/Tertiary Air (mm <sup>2</sup> ): <b>196.38mm<sup>2</sup></b>		
Baffle Plate size: <b>505×200×5mm steel</b>		
Flue Dimensions: <b>177.8mm</b>		
Spigot Dimensions:	OD: <b>194mm</b>	ID: <b>185mm</b>
Spigot to Rear of Appliance: <b>105mm</b>		
Rear Internal to External Heat Shield: <b>20-70mm</b>		
Firebox to Side External Heat Shield: <b>N/A</b>		
Heat Shield Material Type: <b>1.5mm steel</b>		
Water Heater Fitted: <b>No</b>		
Fan Location/Speeds: <b>No</b>		
Catalytic Combustor fitted: <b>No</b>		
Grate: <b>Yes</b>		
<b>NOTE: Accuracy of measurement is ±5% of the measured value</b>		

## **7. CONCLUSION**

The Charnwood Cove 3 Free-Standing appliance installed with a Room Seal Flue 8 kit, 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 position shown in Figure 1 of this report in accordance with Appendix B of AS/NZS2918:2018.





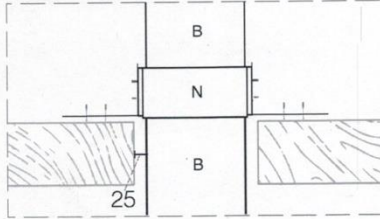
## APPENDIX 1:

### Insulated Room Sealed Flue Kit

8" Full Room Seal Flue Kit  
 RSF FK8FULLYSEALED

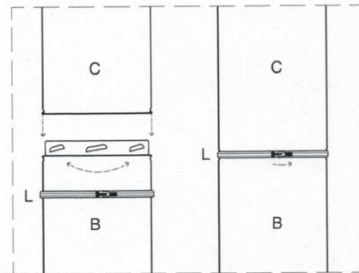
Also available as  
 RSF FK9STANDARD

#### Optional Support Brace



NOTE:  
 The optional support brace (N) has the ability to adjust to any angle of adjacent roof beams  
 \*There is a 25mm clearance between the flue and any timber at all times\*

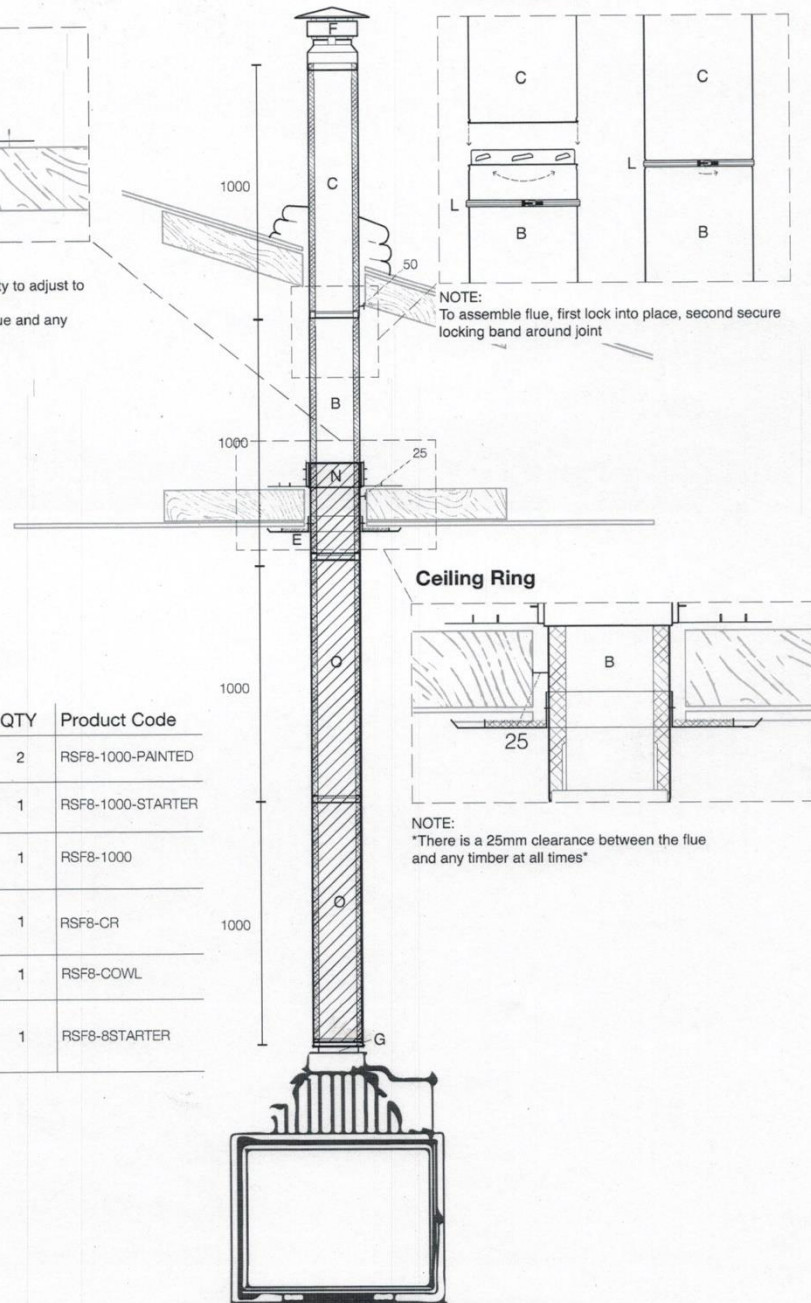
#### Flue Assembly



NOTE:  
 To assemble flue, first lock into place, second secure locking band around joint

#### Full Room Seal Flue Kit

Item	QTY	Product Code
O	2	RSF8-1000-PAINTED
B	1	RSF8-1000-STARTER
C	1	RSF8-1000
E	1	RSF8-CR
F	1	RSF8-COWL
G	1	RSF8-8STARTER



NOTE:  
 \*There is a 25mm clearance between the flue and any timber at all times\*