AUSTRALIAN SOLID FUEL TESTING
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PREPARED FOR

PIVOT STOVE & HEATING

THERMAL CLEARANCE TESTING OF THE CHARNWOOD SKYE 7 FREE-STANDING APPLIANCE

Report Number: ASFT20103-PRELIMINARY REPORT
Issue date: 27 October 2020

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Report Distribution

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ASFT Report Archive

Revision Details

Revision	Date	Comments
0	27/10/2020	Preliminary report – awaiting payment and engineering drawings of appliance

THERMAL CLEARANCE TESTING OF THE CHARNWOOD SKYE 7 FREE-STANDING APPLIANCE

Report

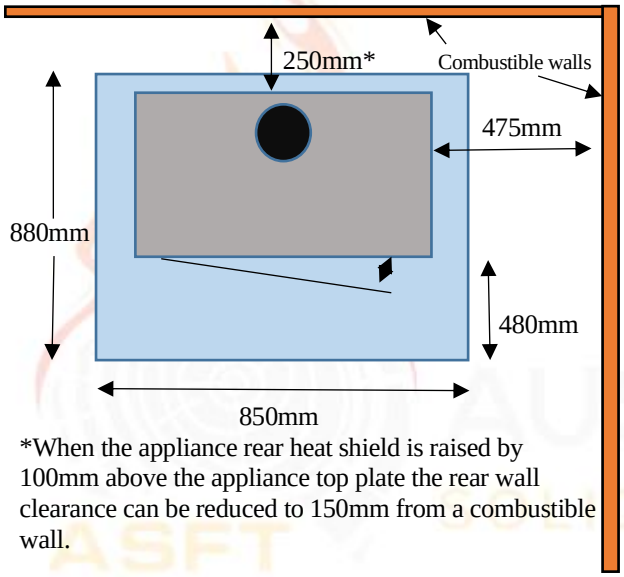
The Charnwood Skye 7 Free-standing appliance installed with a Room Seal Flue Kit was tested in two positions in a manner conforming to joint Australian/New Zealand Standard 2918:2018, Appendix B.

A minimum 880mm deep x 850mm wide x 18mm 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 480mm in front of the appliance door and be placed centrally in the 850mm width. The Thermal resistivity of the floor protector is 0.078m².K/W for 18mm thick compressed board sheets.

The Charnwood Skye 7 Free-Standing solid fuel appliance installed with a Room Seal Flue 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



*When the appliance rear heat shield is raised by 100mm above the appliance top plate the rear wall clearance can be reduced to 150mm from a combustible wall.

Position B – Corner position

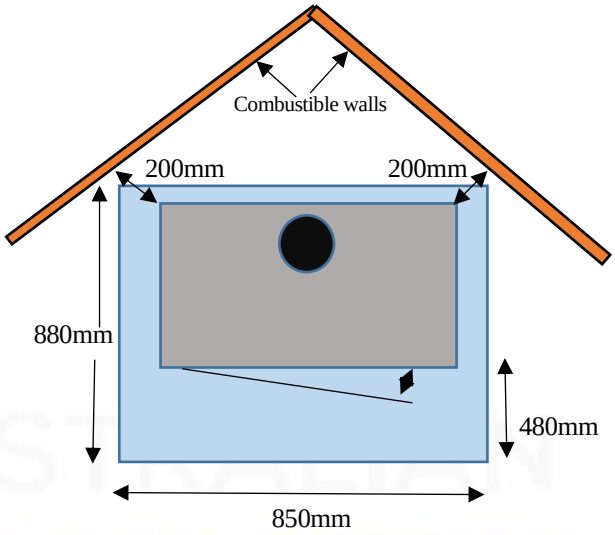


Figure 1 – Clearance Diagram

Signed		**Approved**	
Name	Garry W. Mooney	**Name**	Steve Marland
Title	*Technical Officer*	**Title**	*Managing Director – Australian Solid Fuel Testing*
Date	27/10/2020	**Date**	27/10/2020

1. INTRODUCTION

Thermal Clearance testing of the Charnwood Skye 7 appliance and flue system took place on 26 October 2020 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 – 710mm from corner, 1147mm above the floor
9	Floor – 150mm in front of centre	24	Rear wall – 719mm from corner, 902mm above the floor
10	Floor – Centre of flue	25	Rear wall – 708mm from corner, 555mm above the floor
11	Floor – 150mm behind centre	26	RHS wall, 915mm from corner, 598mm above the floor
12	Floor – 300mm behind centre	27	RHS wall, 308mm from corner, 881mm above the floor
13	Floor – 450mm LHS of centre	28	RHS wall, 322mm from corner, 533mm above the floor
14	Floor – 300mm LHS of centre	29	Rear wall – 658mm from corner, 977mm 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 front	25	LHS wall – 642mm from corner, 706mm above the floor
20	Ceiling Ring – 25mm in front	26	RHS wall, 536mm from corner, 743mm above the floor
21	Ceiling Ring – Inner side	27	RHS wall, 313mm from corner, 889mm above the floor
22	Ceiling Ring – 25mm to side	28	RHS wall, 520mm from corner, 800mm above the floor
23	LHS wall – 594mm from corner, 859mm above the floor	29	LHS wall, 662mm from corner, 978mm above the floor
24	LHS wall – 603mm from corner, 767mm 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 11.7% moisture. Each firewood piece was 200mm x 100mm x 40mm.

4. FLUE SYSTEM

The flue system used during testing was a Room Seal Flue Kit with the Flue casing resting on the appliance top plate. Flue kit was supplied by Pivot Stoves & Heating Co. This flue system has been tested to joint AS/NZS 2918:2018, Appendix F. The flue height was 4.6 ± 0.1m 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 2.7kg with an average refuelling rate of 0.9kg/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 2.2kg.

The highest temperature rises were achieved by leaving the main door resting against the door catch with the primary air fully open and the fuel selection control pulled fully out.

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℃

Position	High Fire	Flash Fire
A	10.1 – 21.2	16.3 – 19.9
B	15.1 – 18.6	14.1 – 17.2

Maximum Surface Temperature Rise above Ambient - Position A

Position	Thermocouple Number	High Fire Test (°C)	Thermocouple Number	Flash Fire Test (°C)
Floor	4	59.8	7	58.5
Ceiling	20	36.0	20	29.0
Rear Wall	29	61.9	29	39.2
Side Wall	26	60.2	26	52.7

Maximum Surface Temperature Rise above Ambient - Position B

Position	Thermocouple Number	High Fire Test (°C)	Thermocouple Number	Flash Fire Test (°C)
Ceiling	20	33.9	20	33.4
RHS Wall	28	58.5	26	53.0
LHS Wall	24	51.2	24	43.6

5.4 Uncertainty of Measurement Statement

5.5.1 The uncertainty of distance measurement for determining clearance distances was not greater than ± 3mm.

5.5.2 The uncertainty of temperature measurement during the entire test period was a maximum of ± 2°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: **Skye 7**		Serial No: **AUL1137**
Manufacturer: **Charnwood**		
Overall Height: **710mm**	Overall Depth: **400mm**	Overall Width: **565mm**
Top Plate Width: **565mm**	Top Plate Depth: **387mm**	Top Plate Thickness: **5mm**
Usable Firebox Height: **217-276mm**	Width: **443mm**	Depth: **232mm**
Usable Firebox Volume: **24.5 Litres**		
Firebox Material Type/Seam Fully Welded: **Fully welded 5mm steel**		
Firebrick Type: **30mm compressed vermiculite**		
Main Door Opening Height: **320mm**		Width: **445mm**
Door Height: **475mm**	Width: **566mm**	Depth: **42mm**
Door glass Height: **287mm**	Width: **417mm**	
Primary Air Location: **Below firebox**		
Dimension of Primary Air: **4 variable shaped slots**		
Area of Primary (mm^2): **1855mm^2**		
Secondary/Tertiary Air Location: **Rear of firebox 35mm below baffle**		
Dimension of Secondary/Tertiary Air: **6 holes @ 5mm + 8 slots 25×6mm with rounded ends**		
Area of Secondary/Tertiary Air (mm^2): **117.83+226.22 = 1138.22mm^2**		
Baffle Plate size: **460x243x30mm compressed vermiculite, secondary baffle: 255x220x5mm**		
Flue Dimensions: **152mm**		
Spigot Dimensions:	OD: **N/A**	ID: **165mm, 154mm with adapter ring**
Spigot to Rear of Appliance: **63mm**		
Rear Internal to External Heat Shield: **15mm, shield: 484mm×225mm**		
Firebox to Side External Heat Shield: **25mm**		
Heat Shield Material Type: **1.2mm**		
Water Heater Fitted: **No**		
Fan Location/Speeds: **No**		
Catalytic Combustor fitted: **No**		
Grate: **Yes**		
Ash pan: **Yes**		
NOTE: Accuracy of measurement is ±5% of the measured value		

7. CONCLUSION

The Charnwood Skye 7 Free-standing appliance installed with a Room Seal Flue 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 positions shown in Figure 1 of this report in accordance with Appendix B of AS/NZS2918;2018.

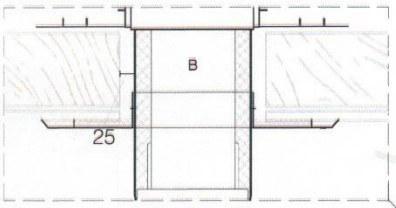
APPENDIX 1:

Room Seal Flue Kit

Installation Manual

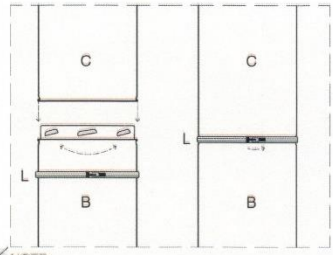
Reduced Clearance
4m Flue Kit

Ceiling Ring

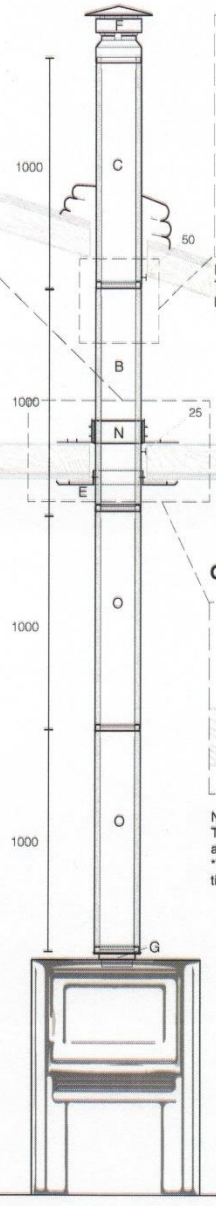


NOTE:
There is a 25mm clearance between the flue and any timber at all times

Flue Assembly



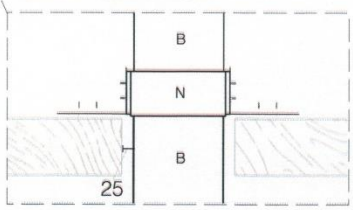
NOTE:
To assemble flue, first lock into place, second secure locking band around joint



Reduced Clearance Flue Kit

	Item	OTY	Product Code
O	1000mm RSF, painted black (with Locking Band) Inside diameter: 150mm Outside diameter: 200mm	2	RFS-1000-black
B	1000mm starter length, end painted for drop box Inside diameter: 150mm Outside diameter: 200mm	1	RSF-1000 Starter
C	1000mm Room Sealed Flue (with Locking Band) Inside diameter: 150mm Outside diameter: 200mm	1	RSF-1000
E	Ceiling Ring	1	Choose correct ceiling ring pitch, see extra parts for options
F	8" Wind Cowl Stainless Steel Inside diameter: 150mm Outside diameter: 200mm	1	RFS-COWL
G	Room Sealed Flue Adapter Single to twin 150mm - 200mm	1	RSF-STARTER

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

PIVOT stove & heating

Address: 120 Victoria street, Nth Geelong
Phone: 1300 4 PIVOT / 1300 474 868
Website: Pivotstove.com.au

The flue is tested to XXXXXX I Approval number XXXXX

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