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**PREPARED FOR**

# SCHOTS HOME EMPORIUM



## **THERMAL CLEARANCE TESTING OF THE BOXTER FREE STANDING APPLIANCE**

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## Revision Details

Revision	Date	Comments
0	15/02/2023	Preliminary report – awaiting payment and engineering drawings of appliance
1	04/05/2023	Issue of NATA endorsed test report

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## THERMAL CLEARANCE TESTING OF THE BOXTER FREE-STANDING APPLIANCE

### Report

The Boxter Free Standing appliance installed with a Wildcat 6” triple skin flue system with a 8”solid casing was tested in one position in a manner conforming to joint Australian/New Zealand Standard 2918:2018, Appendix B.

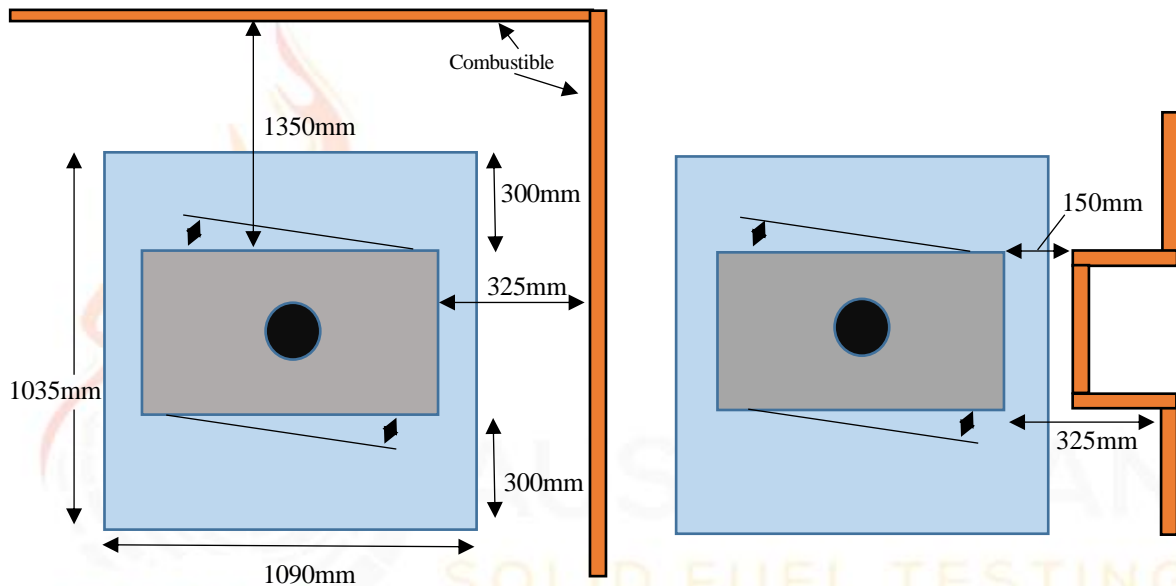
A minimum 1035mm deep x 1090mm wide x 6mm thick floor protector (compressed board) should be used under and in front of the appliance base when installing the appliance (see joint AS/NZS 2918:2018 3.3.2). The floor protector should extend 300mm in front of each door of the appliance and be placed centrally in the 1090mm width. The Thermal resistivity of the floor protector is 0.026m<sup>2</sup>.K/W for 6mm thick compressed board sheets.

The Boxter Free-Standing solid fuel appliance installed with a Wildcat 6” triple skin flue system with a 8”solid 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:



Position A – Parallel position

Overhead View



\* The appliance can spin 360 degrees on its base. Therefore, when the front of appliance faces a combustibile wall, the minimum 1350mm clearance to combustibile surfaces must be maintained. A minimum forehearth clearance of 300mm must be maintained in front of each door of the appliance.

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>	04/05/2023	<b>Date</b>	04/05/2023

## 1. INTRODUCTION

Thermal Clearance testing of the Appliance and flue system took place on 13 February 2023 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 – 606mm from corner, 1502mm above the floor
9	Floor – 150mm in front of centre	24	Rear wall – 535mm from corner, 842mm above the floor
10	Floor – Centre of flue	25	Rear wall – 588mm from corner, 853mm above the floor RHS wall between appliance and wall, 1623mm from corner, 827mm above floor
11	Floor – 150mm behind centre	26	RHS wall in front of door, 2174mm from corner, 699mm above the floor RHS wall between appliance and wall, 1586mm from corner, 621mm above floor
12	Floor – 300mm behind centre	27	RHS wall, 1568mm from corner, 1232mm above the floor
13	Floor – 450mm LHS of centre	28	RHS wall in front of door, 892mm from corner, 773mm above the floor RHS wall above appliance top plate, 1604mm from corner, 1066mm above floor
14	Floor – 300mm LHS of centre	29	Rear wall – 579mm from corner, 641mm 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 12.1% moisture. Each firewood piece was 300mm x 95mm x 40mm.

## **4. FLUE SYSTEM**

The flue system used during testing was a Wildcat 6" triple skin flue system with a 8" solid casing which was manufactured by Wildcat Industries (Aust) Pty Ltd. 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 8.9kg with an average refuelling rate of 1.1kg/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 6.4kg.

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	10.0 – 28.7	24.3 – 31.7

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

Position	Thermocouple Number	High Fire Test (°C)	Thermocouple Number	Flash Fire Test (°C)
Floor	5	54.9	5	53.9
Ceiling	22	55.0	22	71.6
Rear Wall	29	62.2	29	59.2
Side wall in front of door	26	63.5	-	-
Side Wall	28	61.9	28	77.0

### 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>Boxter</b>		Serial No: <b>None</b>
Manufacturer: <b>Schots Home Emporium</b>		
Overall Height: <b>858mm</b>	Overall Depth: <b>435mm</b>	Overall Width: <b>830mm</b>
Top Plate Width: <b>830mm</b>	Top Plate Depth: <b>435mm</b>	Top Plate Thickness: <b>4mm</b>
Appliance base Height: <b>5mm</b>	Diameter: <b>595mm</b>	
Appliance pedestal Height: <b>405mm</b>	Diameter: <b>215mm</b>	
Usable Firebox Height: <b>258mm</b>	Width: <b>652mm</b>	Depth: <b>295mm</b>
Usable Firebox Volume: <b>49.62 Litres</b>		
Firebox Material Type/Seam Fully Welded: <b>Fully welded 5mm steel</b>		
Firebrick Type: <b>20mm compressed vermiculite on sides only</b>		
Main Door Opening Height: <b>312mm</b>	Width: <b>692mm</b>	× 2
Door Height: <b>380mm</b>	Width: <b>780mm</b>	Depth: <b>40mm</b> × 2 doors
Door glass Height: <b>360mm</b>	Width: <b>780mm</b>	× 2 doors
Primary Air Location: <b>below grate + uncontrolled air wash</b>		
Dimension of Primary Air: <b>6 slots @ 28×15mm below grate + 4 slots @ 35+5mm + 4 slots @ 20×5mm</b>		
Area of Primary (mm <sup>2</sup> ): <b>2,520mm<sup>2</sup> below grate + 1,100mm<sup>2</sup> air wash uncontrolled</b>		
Secondary/Tertiary Air Location: <b>Below baffle</b>		
Dimension of Secondary/Tertiary Air: <b>30 holes @ 3.5mm</b>		
Area of Secondary/Tertiary Air (mm <sup>2</sup> ): <b>288.7mm<sup>2</sup></b>		
Baffle Plate size: <b>692×180×5mm</b>		
Flue Dimensions: <b>152mm</b>		
Spigot Dimensions:	OD: <b>199mm</b>	ID: <b>152mm</b>
Spigot to Side of Appliance: <b>315mm</b>		
Rear Internal to External Heat Shield: <b>N/A</b>		
Firebox to Side External Heat Shield: <b>60mm</b>		
Heat Shield Material Type: <b>4mm 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 Boxter Free Standing appliance installed with a Wildcat 6” triple skin flue system with a 8”solid 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:**

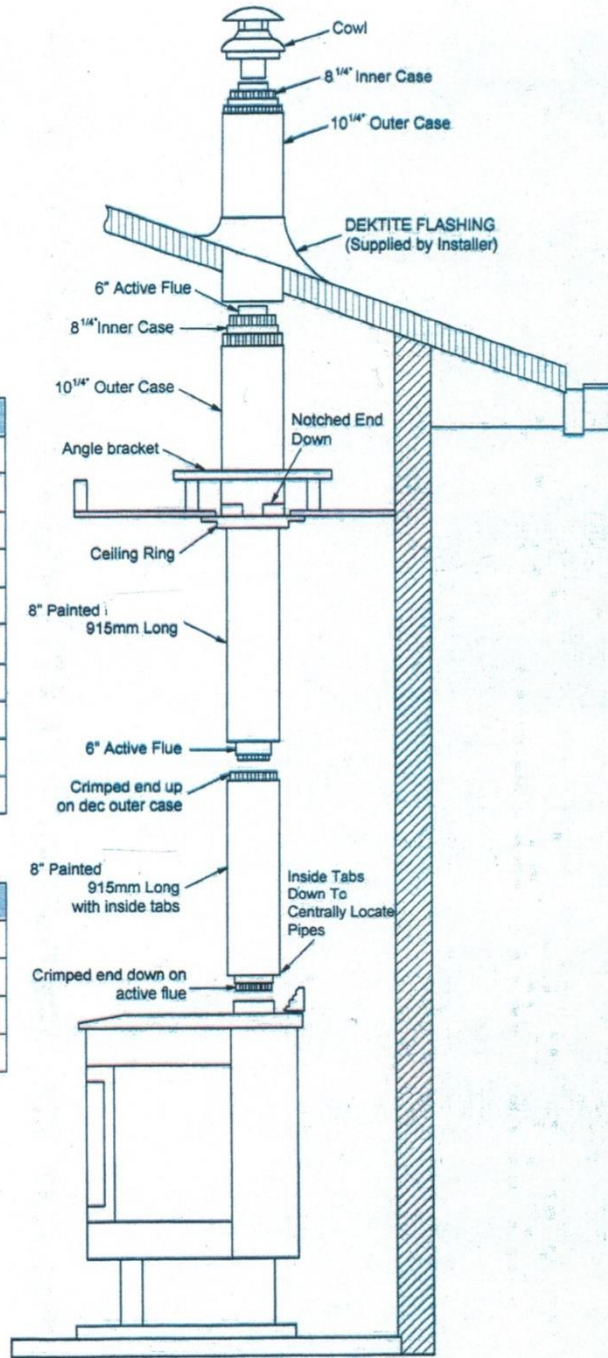


**Freestanding Triple Skin  
 Flue Kit  
 6" - 8" - 10" System**

QTY	DESCRIPTION
4	6" Stainless Steel Inner Flue 915mm Long
1	7 1/4" Painted 915mm Long
1	7 1/4" Painted 915mm Long with in-tabs
2	8" Galvanized Inner Flue Casing 915mm Long
1	10" Galvanized Notched Outer Flue Casing 915mm Long
1	10" Galvanized Outer Flue Casing 915mm Long
1	Cowl
1	Ceiling Ring
2	75 x 25 Angles 915mm Long
1	Installation Guide

CARTON SPECIFICATIONS	
Height	460mm
Width	460mm
Length	1150mm
Weight	32kg

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 PH: 03 9706 5544  
 ABN 84 112 862 718  
[www.wildcatindustries.com.au](http://www.wildcatindustries.com.au)



MUST ONLY BE INSTALLED BY AN AUTHORISED PERSON IN COMPLIANCE WITH AS 2918

Freestanding 10 Triple Skin Instruction page