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**PREPARED FOR**  
**PACIFIC ENERGY FIREPLACE**  
**PRODUCTS**



**THERMAL CLEARANCE TESTING OF THE PACIFIC**  
**ENERGY FIREPLACE PRODUCTS TN20 B FREE-STANDING**  
**APPLIANCE**

Report Number: ASFT18069-1  
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By  
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### Revision Details

Revision	Date	Comments
0	14/08/2018	Preliminary Issue – pending payment of invoice and engineering drawings
1	01/11/2018	Issue of NATA endorsed report

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## THERMAL CLEARANCE TESTING OF THE PACIFIC ENERGY FIREPLACE PRODUCTS TN20 B FREE-STANDING SOLID FUEL APPLIANCE

### Report

The Pacific Energy Fireplace Products TN20 B Free-standing appliance and a Wildcat 6” triple 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 1060mm deep x 720mm wide x 8mm 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 fuel loading door and be placed centrally in the 720mm width. The Thermal conductivity of the floor protector is 0.08m<sup>2</sup>.K/W for 8mm thick sheets.

The Pacific Energy Fireplace Products TN20 B Free-Standing solid fuel appliance installed with a Wildcat 6” triple flue kit conforms to the requirements of the joint AS/NZS 2918:2018 Standard, Appendix B.

The appliance and flue were tested at the following clearances;

Position A – Parallel position

Position B – Corner position

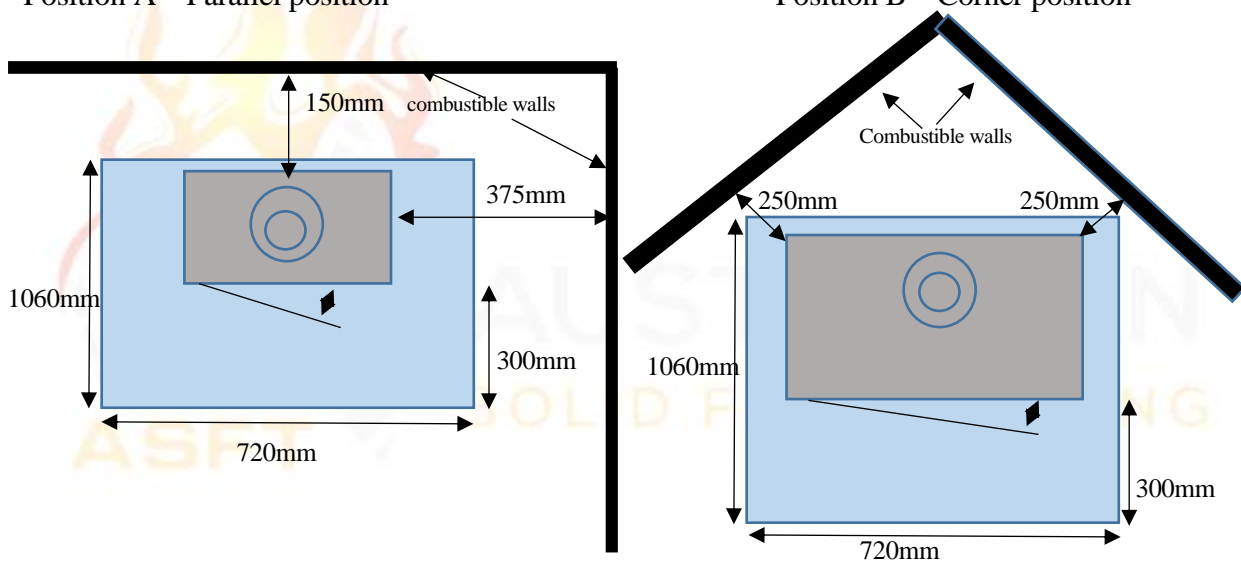


Figure 1 – Clearance Diagram

<b>Signed</b>	<b>Approved</b>
<b>Name</b> Garry W Mooney	<b>Name</b> Steve Marland
<b>Title</b> Technical Officer	<b>Title</b> Managing Director – Australian Solid Fuel Testing
<b>Date</b> 1/11/2018	<b>Date</b> 1/11/2018

## 1. INTRODUCTION

Thermal Clearance testing of the Pacific Energy Fireplace Products TN20 B appliance and flue system took place from August 9 to 13, 2018 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 – 616mm from corner, 971 mm above the floor
9	Floor – 150mm in front of centre	24	Rear wall – 585mm from corner, 786mm above the floor
10	Floor – Centre of flue	25	Rear wall – 574mm from corner, 875mm above the floor
11	Floor – 150mm behind centre	26	RHS wall, 1072mm from corner, 492mm above the floor
12	Floor – 300mm behind centre	27	RHS wall, 395mm from corner, 596mm above the floor
13	Floor – 450mm LHS of centre	28	RHS wall, 468mm from corner, 924mm above the floor
14	Floor – 300mm LHS of centre	29	Rear wall, 622mm from corner, 933mm 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 – 721mm from corner, 939mm above the floor
20	Ceiling Ring – 25mm in front	26	RHS wall, 596mm from corner, 1184mm above the floor
21	Ceiling Ring – Inner side	27	RHS wall, 641mm from corner, 993mm above the floor
22	Ceiling Ring – 25mm to side	28	RHS wall, 744mm from corner, 940mm above the floor
23	LHS wall – 605mm from corner, 972mm above the floor	29	LHS wall – 678mm from corner, 893mm above the floor
24	LHS wall – 788mm from corner, 982mm 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 12.9%. Each firewood piece was 300mm x 100mm x 40mm.

### **4. FLUE SYSTEM**

The flue system used during testing was a Wildcat 6" triple Flue kit which used a decromesh casing above the appliance to the ceiling. The flue kit was manufactured by Wildcat Industries (Aust) Pty Ltd. This flue system has not been tested to joint AS/NZS 2918:2001, 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 7.2kg with an average refuelling rate of 1.0kg/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;2001. The average fuel load for initiating the Flash Fire tests was 5.7kg. The highest temperature rises were achieved by leaving the main door ajar 20mm from the door catch and the primary air fully open.

## 5.4 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	10.6 – 17.7	11.7 – 16.8
B	10.2 – 13.9	10.0 – 14.3

### *Maximum Surface Temperature Rise above Ambient - Position A & B (parallel position)*

Position	Thermocouple Number	High Fire Test (°C)	Thermocouple Number	Flash Fire Test (°C)
Floor	4	47.1	4	47.6
Ceiling	22	15.7	22	16.2
Rear Wall	29	62.3	29	80.2
Side Wall	28	57.8	28	60.1

### *Maximum Surface Temperature Rise above Ambient - Position B (corner position)*

Position	Thermocouple Number	High Fire Test (°C)	Thermocouple Number	Flash Fire Test (°C)
Ceiling	22	17.4	20	172
Right Hand Side Wall	25	55.1	25	75.6
Left Hand Side Wall	28	56.6	27	56

## 5.5 Uncertainty of Measurement Statement

5.5.1 The uncertainty of distance measurement for determining clearance distances was not greater than  $\pm 3\text{mm}$ .

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>TN 20 B</b>		Serial No: <b>N/A</b>
Manufacturer: <b>Pacific Energy Fireplace Products</b>		
Overall Height: <b>715mm</b>	Overall Depth: <b>762mm</b>	Overall Width: <b>545mm</b>
Top Plate Width: <b>542mm</b>	Top Plate Depth: <b>605mm</b>	Top Plate Thickness: <b>6mm</b>
Appliance legs Height: <b>230mm</b>	Depth: <b>35 - 90mm</b>	Width: <b>35 - 90mm</b>
Appliance pedestal Height:	Depth:	Width:
Usable Firebox Height: <b>293mm</b>	Width: <b>388mm</b>	Depth: <b>460mm</b>
Usable Firebox Volume: <b>56.72 Litres</b>		
Firebox Material Type/Seam Fully Welded: <b>Fully welded 3.5mm steel</b>		
Firebrick Type: <b>Fully lined 33mm ceramic</b>		
Main Door Opening Height: <b>216mm</b>	Width: <b>316mm</b>	
Door Height: <b>318mm</b>	Width: <b>420mm</b>	Depth: <b>20mm</b>
Door glass Height: <b>218mm</b>	Width: <b>318mm</b>	
Primary Air Location: <b>Below firebox at front</b>		
Dimension of Primary Air: <b>rounded end rectangle @ 35mm wide x 36mm long plus 1 x 7mm hole</b>		
Area of Primary (mm <sup>2</sup> ): <b>1128.6mm<sup>2</sup></b>		
Secondary/Tertiary Air Location: <b>4 Tubes below the baffle with 30 holes each facing forward</b>		
Dimension of Secondary/Tertiary Air: <b>30 x 3.5mm holes in each tube</b>		
Area of Secondary/Tertiary Air (mm <sup>2</sup> ): <b>1154.7mm</b>		
Baffle Plate size: <b>420 x 370 x 25mm, 2-piece Calcium Silicate</b>		
Flue Dimensions: <b>152mm</b>		
Spigot Dimensions:	OD: <b>159mm</b>	ID: <b>152mm</b>
Spigot to Rear of Appliance: <b>85mm</b>		
Rear Internal to External Heat Shield: <b>50mm</b>		
Firebox to Side External Heat Shield: <b>40mm</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>No</b>		
<b>NOTE: Accuracy of measurement is ±5% of the measured value</b>		

## 7. CONCLUSION

The Pacific Energy Fireplace Products TN20 B Free-standing appliance and Wildcat 6” triple 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 two test positions shown in Figure 1 of this report in accordance with Appendix B of AS/NZS2918;2018.





**APPENDIX 1:**

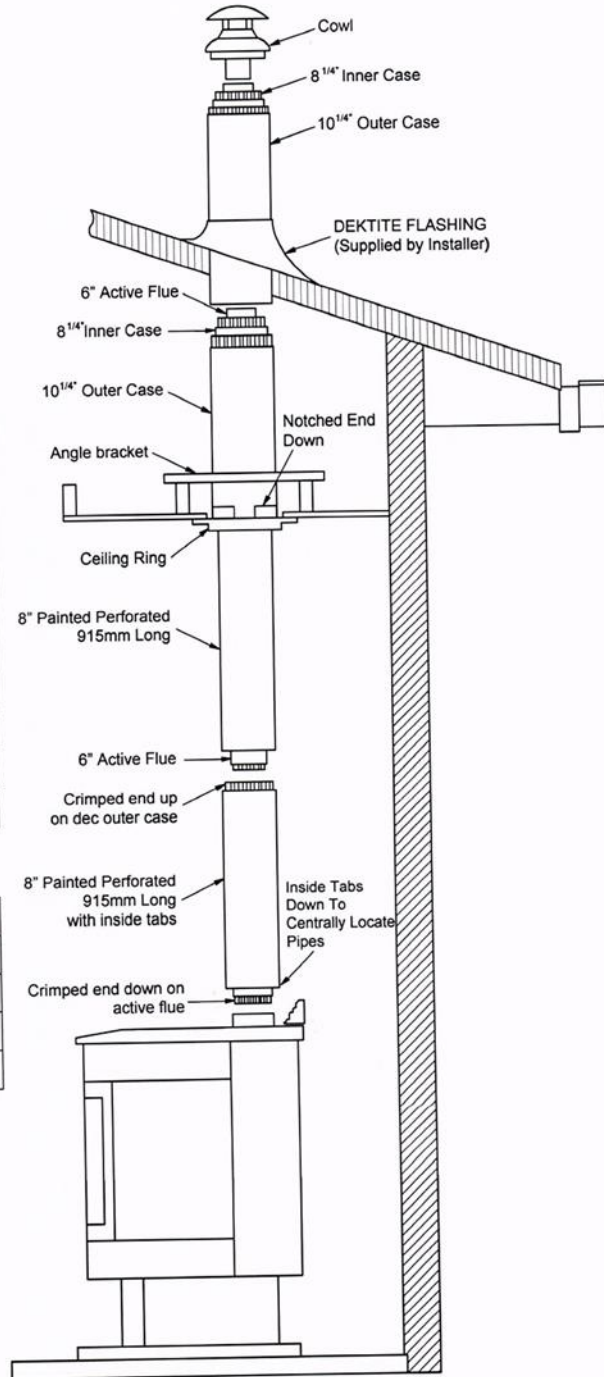


**Freestanding Triple Skin  
 Flue Kit Perforated  
 6" - 8" - 10" System**

QTY	DESCRIPTION
4	6" Stainless Steel Inner Flue 915mm Long
1	7 3/4" Painted Perforated 915mm Long
1	7 3/4" Painted Perforated 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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**MUST ONLY BE INSTALLED BY AN AUTHORISED PERSON IN COMPLIANCE WITH AS 2918**

Freestanding 10 Triple Skin Instruction page