AUSTRALIAN SOLID FUEL TESTING
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PREPARED FOR

PACIFIC ENERGY FIREPLACE PRODUCTS

THERMAL CLEARANCE TESTING OF THE PACIFIC ENERGY FIREPLACE PRODUCTS TN10 FREE-STANDING APPLIANCE

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Report Distribution

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THERMAL CLEARANCE TESTING OF THE PACIFIC ENERGY FIREPLACE PRODUCTS TN10 FREE-STANDING SOLID FUEL APPLIANCE

Report

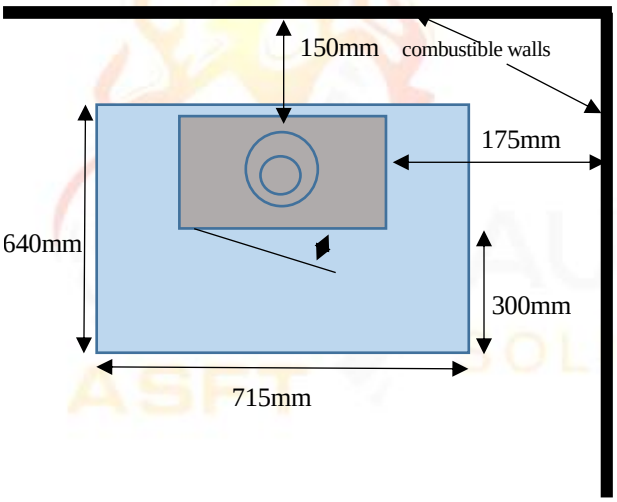
The Pacific Energy Fireplace Products TN10 Free-standing appliance and a Wildcat 6" triple flue kit with 8" decromesh casing was tested in two positions in a manner conforming to joint Australian/New Zealand Standard 2918:2018, Appendix B.

A minimum 640mm deep x 715mm 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 715mm width. The Thermal conductivity of the floor protector is 0.08m².K/W for 8mm thick sheets.

The Pacific Energy Fireplace Products TN10 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

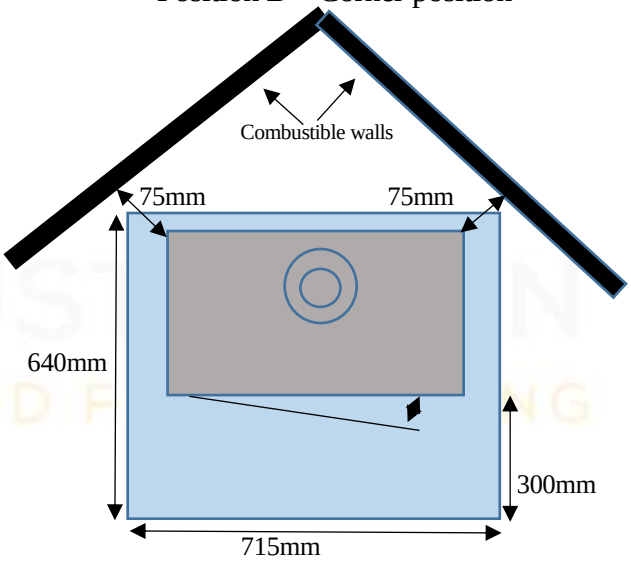


Figure 1 – Clearance Diagram

Signed		**Approved**	
Name	Garry W Mooney	**Name**	Steve Marland
Title	*Technical Officer*	**Title**	*Managing Director – Australian Solid Fuel Testing*
Date	01/11/2018	**Date**	01/11/2018

1. INTRODUCTION

Thermal Clearance testing of the Pacific Energy Fireplace Products TN10 appliance and flue system took place from August 24 to 27, 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

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 – 493mm from corner, 713mm above the floor
9	Floor – 150mm in front of centre	24	Rear wall – 359mm from corner, 669mm above the floor
10	Floor – Centre of flue	25	Rear wall – 354mm from corner, 779mm above the floor
11	Floor – 150mm behind centre	26	RHS wall, 715mm from corner, 470mm above the floor
12	Floor – 300mm behind centre	27	RHS wall, 361mm from corner, 803mm above the floor
13	Floor – 450mm LHS of centre	28	RHS wall, 274mm from corner, 489mm above the floor
14	Floor – 300mm LHS of centre	29	Rear wall – 378mm from corner, 503mm 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 – 351mm from corner, 778mm above the floor
20	Ceiling Ring – 25mm in front	26	RHS wall, 413mm from corner, 684mm above the floor
21	Ceiling Ring – Inner side	27	RHS wall, 361mm from corner, 810mm above the floor
22	Ceiling Ring – 25mm to side	28	RHS wall, 304mm from corner, 727mm above the floor
23	LHS wall – 465mm from corner, 870mm above the floor	29	LHS wall, 441mm from corner, 751mm above the floor
24	LHS wall – 357mm from corner, 667mm 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 175mm 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 2918:2018, 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/NZS 2918;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 3.3kg with an average refuelling rate of 0.5kg/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 2.6kg. The highest temperature rises were achieved by leaving the main door ajar 25mm 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℃

Position	High Fire	Flash Fire
A	10.0 – 15.4	12.6 – 18.0
B	11.9 – 15.5	12.9 – 16.6

Maximum Surface Temperature Rise above Ambient - Position A (parallel position)

Position	Thermocouple Number	High Fire Test (°C)	Thermocouple Number	Flash Fire Test (°C)
Floor	7	35.4	7	31.0
Ceiling	21	8.4	20	12.0
Rear Wall	24	61.0	24	80.4
Side Wall	26	49.4	27	58.1

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

Position	Thermocouple Number	High Fire Test (°C)	Thermocouple Number	Flash Fire Test (°C)
Ceiling	20	12.7	20	12.2
Left Hand Side Wall	24	48.1	29	57.1
Right Hand Side Wall	28	49.0	28	71.5

5.5 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: **TN10**		Serial No: **31510041**
Manufacturer: **Pacific Energy Fireplace Products**		
Overall Height: **645mm**	Overall Depth: **340mm**	Overall Width: **542mm**
Top Plate Width: **542mm**	Top Plate Depth: **340mm**	Top Plate Thickness: **6mm**
Appliance legs Height: **175mm**	Depth: **35 - 80mm**	Width: **35 - 80mm**
Appliance pedestal Height:	Depth:	Width:
Usable Firebox Height: **263mm**	Width: **354mm**	Depth: **206mm**
Usable Firebox Volume: **19.18 Litres**		
Firebox Material Type/Seam Fully Welded: **fully welded 3.5mm steel**		
Firebrick Type: **Fully lined 32mm ceramic**		
Main Door Opening Height: **212mm**		Width: **315mm**
Door Height: **320mm**	Width: **420mm**	Depth: **22mm**
Door glass Height: **215mm**	Width: **315mm**	
Primary Air Location: **Below firebox at front**		
Dimension of Primary Air: **bullet shaped slot**	**35mm x 24mm**	
Area of Primary (mm2): **831mm²**		
Dimension of Boost Air: **1 x 7mm Hole**		
Area of Boost (mm^2): **38.49**mm^2		
Secondary/Tertiary Air Location: **4 × tubes below baffle with 28 holes in each all facing forward**		
Dimension of Secondary/Tertiary Air: **112 x 3.5mm holes**		
Area of Secondary/Tertiary Air (mm^2): **1077.7**mm^2		
Baffle Plate size: **193mm x 355mm x 25mm, 2-piece Calcium Silicate**		
Flue Dimensions: **152mm**		
Spigot Dimensions:	OD: **160mm**	ID: **152mm**
Spigot to Rear of Appliance: **35mm**		
Rear Internal to External Heat Shield: **25mm**		
Firebox to Side External Heat Shield: **50mm**		
Heat Shield Material Type: **1mm steel**		
Water Heater Fitted: **No**		
Fan Location/Speeds: **No**		
Catalytic Combustor fitted: **No**		
Grate: **No**		
NOTE: Accuracy of measurement is ±5% of the measured value		

7. CONCLUSION

The Pacific Energy Fireplace Products TN10 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/NZS 2918;2018.

ASFT AUSTRALIAN SOLID FUEL TESTING

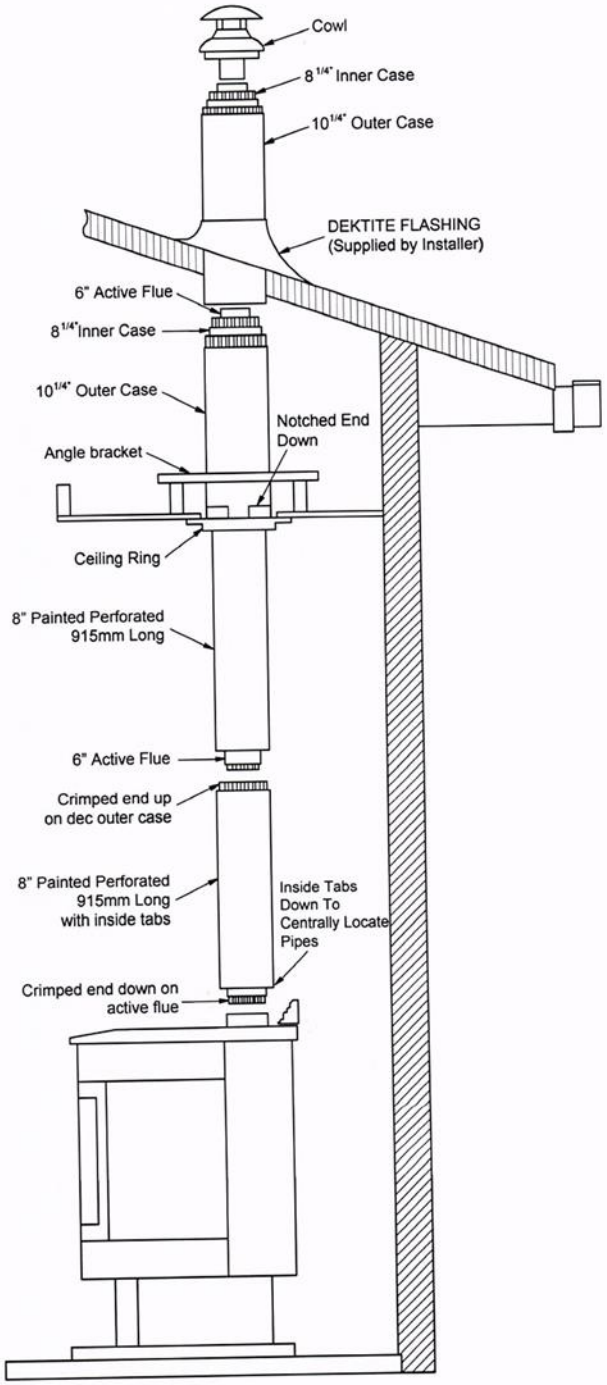
APPENDIX 1:

Wildcat INDUSTRIES (Aust) P/L

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

QTY	DESCRIPTION
4	6" Stainless Steel Inner Flue 915mm Long
1	7¾" Painted Perforated 915mm Long
1	7¾" 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