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PACIFIC ENERGY FIREPLACE PRODUCTS

THERMAL CLEARANCE TESTING OF THE ALDERLEA T5 INSERT SOLID FUEL APPLIANCE

Test Report No: HCMG/16/004

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by
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THERMAL CLEARANCE TESTING OF THE ALDERLEA T5 INSERT APPLIANCE

Report

The appliance and flue system were installed into a simulated fireplace Test enclosure and tested in one position in a manner conforming to joint Australian/New Zealand Standard 2918:2001, Appendix B. A minimum 1330mm deep x 805mm wide x 36mm thick floor protector (Bellis board) should be used under and in front of the appliance base when installing the appliance (see joint AS/NZS 2918:2001 3.3.2). The floor protector should extend 500mm in front of the appliance. The Thermal resistivity of the floor protector is 0.38m².K/W.

The Alderlea T5 insert appliance when installed into a simulated fireplace test enclosure conforms to the requirements of joint AS/NZS 2918:2001, Appendix B, with respect to rear wall, side wall, internal wall noggins, mantle shelf, mantle uprights and floor surface temperatures, when tested in the position described in this report and using *Pinus radiata* firewood as the fuel type.

TEST POSITIONS

The Alderlea T5 insert appliance was tested at the following clearances:

- 200mm from side of appliance door to Mantel upright.
- 455mm from the appliance brow to the mantle shelf, the mantle shelf shall not extend more than 250mm from the wall.
- 405mm from the appliance brow to the mantle key

Refer to Appendix 1 of this report for clearance diagrams.

Investigation: A. Wood & S. Marland

Report: S. Marland

Checked by: D. Jeffries

Signed:

D. Jeffries
Technical Officer

Approved:

S. Marland
Group Leader EGD

1. INTRODUCTION

HRL Technology Pty Ltd was requested to assess the Alderlea T5 Insert solid fuel burning appliance. Clearance testing was performed according to joint AS/NZS 2918:2001, Appendix B.

This report provides details of the safety clearance tests performed at the Solid Fuel Heater Testing and Research Laboratory of HRL Technology Pty Ltd. The testing was conducted from November 15 to 18, 2015, by Mr A Wood & Mr S. Marland. The testing was commissioned by Pacific Energy Fireplace Products and the test results remain the property of this company.

The appliance was tested using *Pinus radiata* as firewood. No testing was undertaken with coal or briquettes.

2. DETAILS OF APPLIANCE

The test results reported below apply only 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 construction or design of this model of the appliance or flue could invalidate this report.

Appendix 2 gives test appliance construction details.

3. INSTALLATION OF THE APPLIANCE

The appliance/flue combination was installed in two test positions at clearances specified by the manufacturer after preliminary testing. Floor thermocouples were positioned according to joint AS/NZS 2918:2001, Appendix B.

3.1 Floor Protector

A floor protector was installed beneath and in front of the appliance. The floor protector (Bellis board or similar) must be installed so that its leading edge is a minimum of 500mm in front of the appliance base. The floor protector must be a minimum of 805mm wide x 1330mm deep x 36mm thick. The floor protector consisted of 4 x 9mm thick Ballis board with a thermal resistance value of 0.38 m²kw.

3.2 Flue System

The flue system used throughout testing was a single skin flue from the top of the appliance which was manufactured by The Flue Factory. This flue system has not been tested to joint AS/NZS 2918:2001, Appendix F by HRL Technology Pty Ltd.

The flue height was 4.6 ± 0.3 m from the floor protector.

4. CLEARANCES

The Alderlea T5 insert appliance was tested at the following clearances:

- 200mm from side of appliance door to Mantel upright.
- 455mm from the appliance brow to the mantle shelf, the mantle shelf shall not extend more than 250mm from the wall.
- 405mm from the appliance brow to the mantle key

Refer to Appendix 1 of this report for clearance diagrams.

5. PROCEDURE

All clearance testing took place from November 15 to 18, 2015. The floor thermocouples were installed into positions as per joint AS/NZS 2918:2001, Appendix B. Other thermocouple positions were determined by monitoring surface temperatures during trial burn cycles. Hot sites were located with the aid of a Linear Laboratories C-600E infra-red pyrometer.

All 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 Tables 1 and 2.

5.1 High Fire Test

The appliance was fully fired in accordance with Section B9.1 of the joint Standard. 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 5.6kg with an average refuelling rate of 1.3kg/10 minutes.

During High Fire testing it was found that the highest surface temperatures caused through the operation of the appliance occurred when the primary air control 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 the joint Standard. The average fuel load for initiating the Flash Fire tests was 4.7kg. Highest temperature rises were achieved by fully opening the primary air control and leaving the main door ajar from the door catch

5.3 Fuel

The appliance was fired using a standard firewood fuel of *Pinus radiata* with an average moisture content of 11.2%. Each firewood piece was 300 mm x 100 mm x 40 mm.

6. RESULTS

6.1 Uncertainty of Measurement Statement

- (a) The uncertainty of distance measurement for determining clearance distances was not greater than ± 2 mm.
- (b) The uncertainty of temperature measurement during the entire test period was $\pm 2^\circ\text{C}$ at the 95% confidence level.

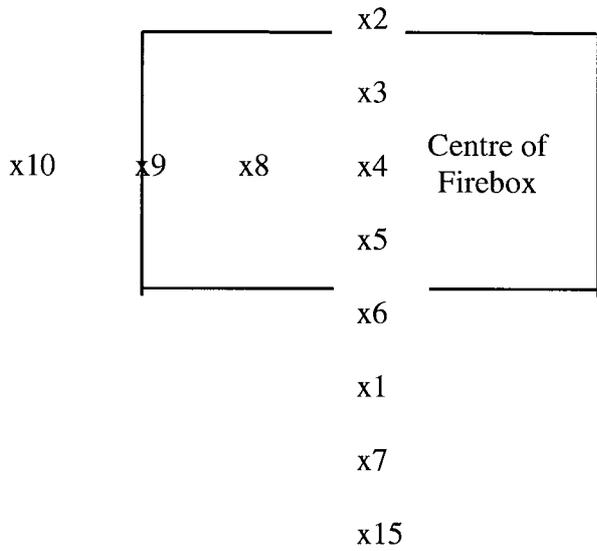
6.2 Test Enclosure Temperatures

Table 3 shows the ambient temperature range during testing. Tables 4 and 5 show the maximum temperature rise above ambient for each test surface.

7. CONCLUSION

The Alderlea T5 Insert solid fuel burning appliance, when installed into a simulated fireplace test enclosure, conforms to the requirements of Australian/New Zealand Standard 2918:2001, with respect to floor, side wall, rear wall, internal noggins, mantle shelf and uprights surface temperatures, when tested in the test positions described earlier in this report in accordance with Appendix B of the joint Standard.

Table 1: Position A



Thermocouple /Channel No

1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
15	15

Thermocouple

Channel No

16 Mantle key	16
17 Mantle shelf	17
18 Mantle shelf	18
19 Mantle Upright	19
20 Ambient temperature	20

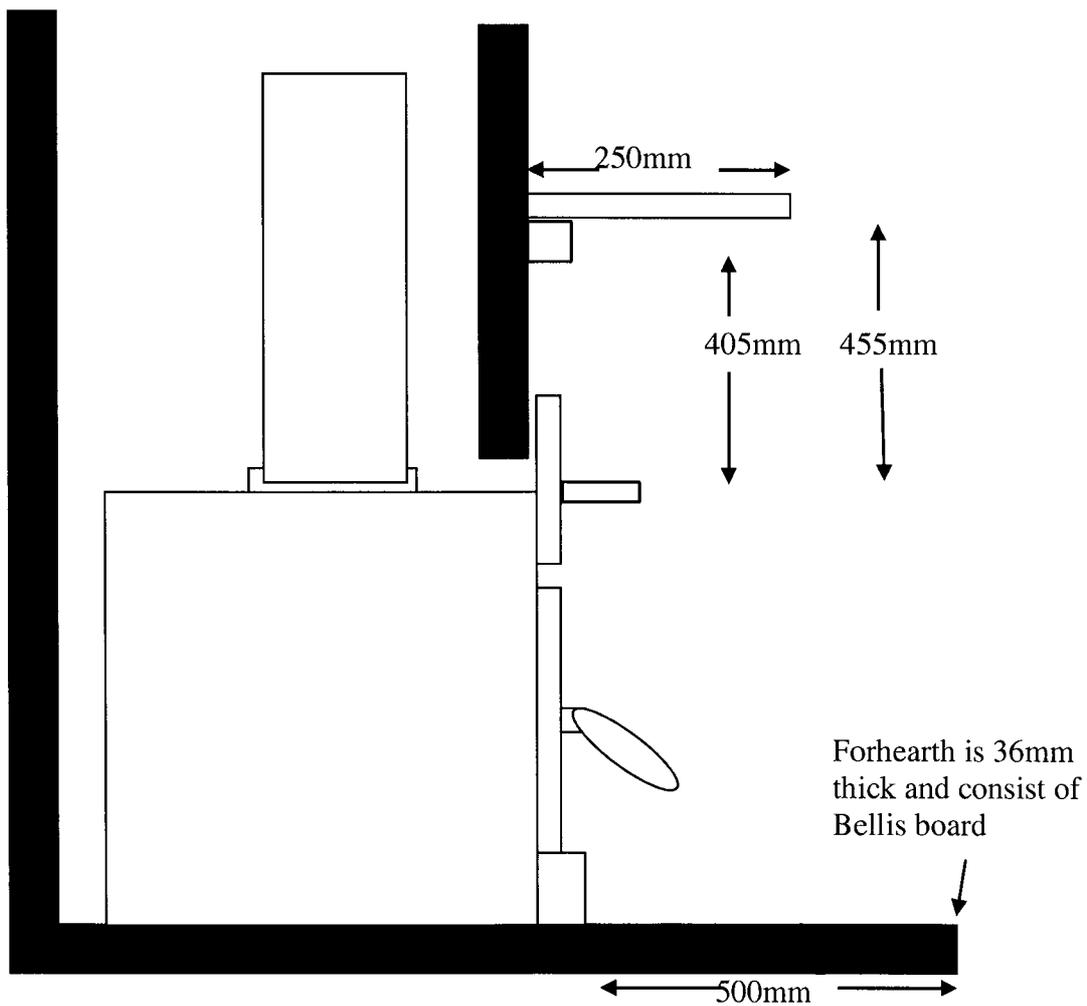
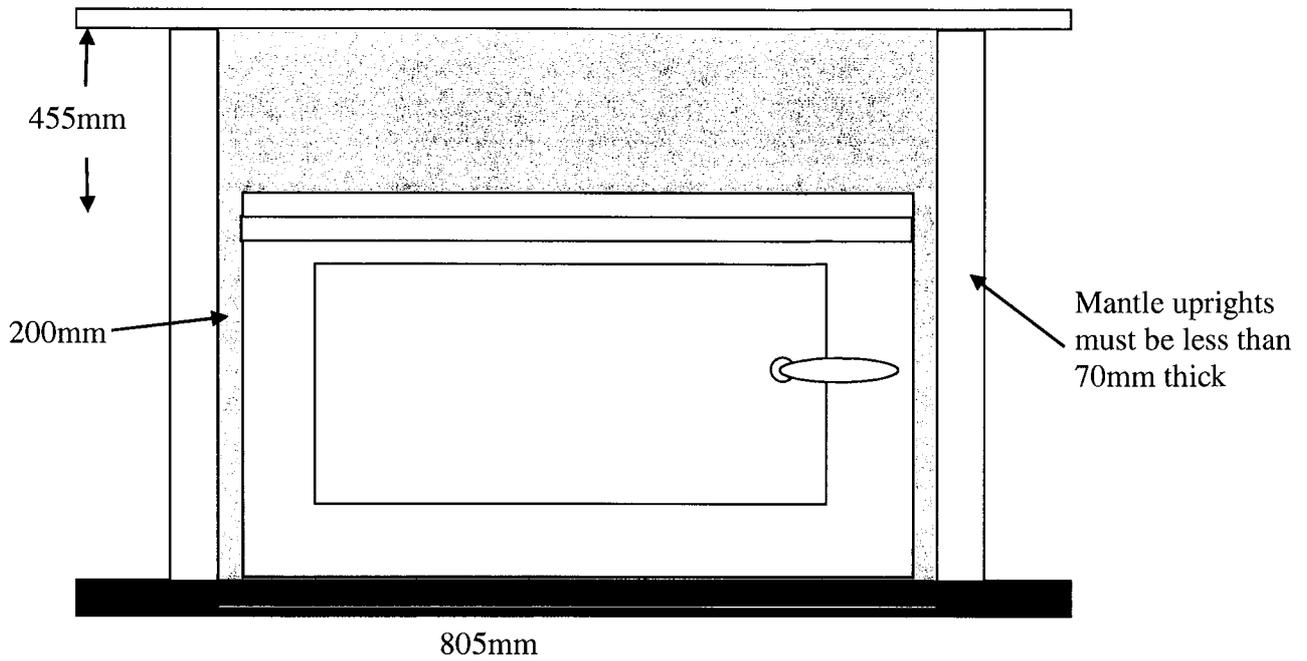
Table 3: Ambient Temperature Range °C

High Fire	Flash Fire
20.2 – 28.1	27.6 – 29.9

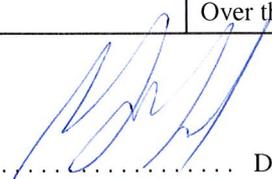
Table 4: Maximum Temperature Rise - Position A

Position	Thermocouple Number	High Fire Test (°C)	Thermocouple Number	Flash Fire Test (°C)
Floor	15	45.3	15	45.2
Mantle shelf	17	29.8	17	32.9
Mantle Upright	19	38.8	19	45.0
Mantle key	16	36.1	16	35.0

**APPENDIX 1:
MINIMUM CLEARANCES FOR THE ALDERLEA T6 FIREPLACE INSERT**



**APPENDIX 2:
SOLID FUEL BURNING APPLIANCE CONSTRUCTION DETAILS**

Appliance Model Name:	Alderlea T5		
Manufacturer:	Pacific Energy Fireplace Products		
Serial Number:	002034		
Overall Height (to top of top plate):	590mm		
Overall Width (not including top plate):	900mm		
Overall Depth (not including top plate):	730mm		
Firebox Description:	<i>Height:320mm</i>	<i>Width:460mm</i>	<i>Depth:463mm</i>
Firebox Material Type/ Seam Fully Welded:	Steel, seams fully welded		
Firebrick Size:	<i>Height: 225mm Thickness:32mm</i>	<i>Width: 113mm No of: 3 on sides + floor</i>	
Main Door Opening:	<i>Height: 214mm</i>	<i>Width: 405mm</i>	
Door:	<i>Width:550mm</i>	<i>Depth:60mm max</i>	
Primary Air Location:	Below firebox		
Dimension of Primary Air:	1 hole @ 56mm dia		
Area of Primary (mm²):	2463mm ²		
Secondary/Tertiary Air Location:	Rear/below firebox		
Dimension of Secondary/Tertiary Air:	1 slot 25 x 40mm		
Area of Secondary/Tertiary Air (mm²):	1000mm ²		
Baffle Plate size and location:	395mm x 305mm x 50mm		
Flue Dimensions:	152mm OD		
Spigot Dimensions:	157mm OD	151mm ID	
Spigot to Rear of Appliance:	115mm		
Rear Internal to External Heat Shield:	45mm		
Side Internal to External Heat Shield:	~65mm		
Water Heater Fitted:			<input type="checkbox"/> No
Fan Location/Speeds:	2 fans, either side of door		
Catalytic Combustor:			<input type="checkbox"/> No
Grate:			<input type="checkbox"/> No
Diagrams:	Over the page		
Signed:   Date: <i>15/01/2016</i>			