AUSTRALIAN SOLID FUEL TESTING
3 Garden Street, Morwell Vic 3840
ABN: 46 610 154 768

PREPARED FOR

LACUNZA

THERMAL CLEARANCE TESTING OF THE LACUNZA NICKEL 800 FREE-STANDING APPLIANCE

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By:
S. Marland

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Revision Details

Revision	Date	Comments
0	08/11/2021	Preliminary report – awaiting payment and engineering drawings of appliance

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THERMAL CLEARANCE TESTING OF THE LACUNZA NICKEL 800 FREE-STANDING APPLIANCE

Report

The Lacunza Nickel 800 Free-Standing appliance installed with a Flo-met SG-FLKIT 200-FS-B Flue Kit was tested in one position in a manner conforming to joint Australian/New Zealand Standard 2918:2018, Appendix B.

A minimum 520mm deep x 720mm wide x 50mm thick floor protector (Skamol board) should be used under the appliance base when installing the appliance (see joint AS/NZS 2918:2018 3.3.2). A minimum 450mm deep x 1110mm wide x 36mm thick floor protector (compressed board) should be used in front of each of the appliance doors and be placed centrally in the 1110mm width. The Thermal resistivity of the 50mm skamol board floor protector is 0.74m².K/W. The Thermal resistivity of the floor protector is 0.16m².K/W for 36mm thick compressed board sheets. Minimum air gap of 40mm must be maintained under the appliance base to the Skamol floor protector.

The Lacunza Nickel 800 Free-Standing solid fuel appliance installed with a Flo-met SG-FLKIT 200-FS-B 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

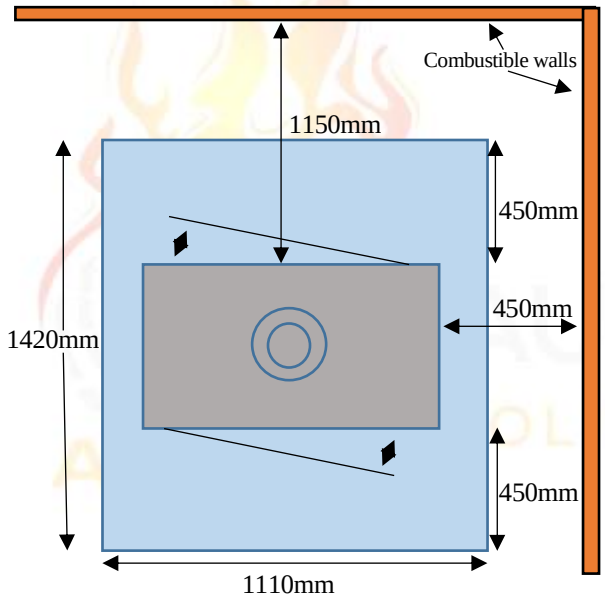

Figure 1 – Clearance Diagram

Signed		**Approved**	
Name	Garry W. Mooney	**Name**	Steve Marland
Title	*Technical Officer*	**Title**	*Managing Director – Australian Solid Fuel Testing*
Date	08/11/2021	**Date**	08/11/2021

1. INTRODUCTION

Thermal Clearance testing of the Appliance and flue system took place on November 5 and 7, 2021 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	Side wall – 1960mm from corner, 493mm above the floor
9	Floor – 150mm in front of centre	24	Side wall – 650mm from corner, 566mm above the floor
10	Floor – Centre of flue	25	Side wall – 800mm from corner, 394mm above the floor
11	Floor – 150mm behind centre	26	Side wall - 1345mm from corner, 931mm above the floor
12	Floor – 300mm behind centre	27	Rear wall - 765mm from corner, 386mm above the floor
13	Floor – 450mm LHS of centre	28	Rear wall - 682mm from corner, 641mm above the floor
14	Floor – 300mm LHS of centre	29	Rear wall - 752mm from corner, 647mm 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 12.4% moisture. Each firewood piece was 300mm x 100mm x 50mm.

4. FLUE SYSTEM

The flue system used during testing was a Flo-met SG-FLKIT 200-FS-B Flue Kit incorporating a 515mm ceiling ring with a 15mm air gap between the ceiling and the ceiling ring which was manufactured by Floate Metal Fabrications 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/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 15.6kg with an average refuelling rate of 1.6kg/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 11.3kg.

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℃

Position	High Fire	Flash Fire
A	17.9 – 33.9	25.1 – 30.5

Maximum Surface Temperature Rise above Ambient - Position A

Position	Thermocouple Number	High Fire Test (°C)	Thermocouple Number	Flash Fire Test (°C)
Floor	5	63.6	4	65.6
Ceiling	19	34.0	19	66.1
Rear Wall	27	63.1	27	55.1
Side Wall	26	61.3	26	82.8

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: **Nickel 800** Serial No: **1015**
Manufacturer: **Lacunza**
Overall Height: **548m** Overall Depth: **517mm** Overall Width: **842mm**
Top Plate Width: **800mm** Top Plate Depth: **510mm** Top Plate Thickness: **3mm**
Appliance Feet Height: **40mm** Depth: **25mm** Width: **25mm**
Appliance Fascia Height: **560mm** Depth: **3mm** Width: **842mm** **×2**
Usable Firebox Height: **309mm** Width: **650mm** Depth: **410mm**
Usable Firebox Volume: **80.9 Litres**
Firebox Material Type/Seam Fully Welded: **Fully welded 3mm steel**
Firebrick Type: **Fully lined 30mm compressed vermiculite**
Main Door Opening Height: **287mm** Width: **713mm** **×2 doors**
Door Height: **480mm** Width: **765mm** Depth: **35mm** **×2 doors**
Door glass Height: **462mm** Width: **762mm** **×2 doors**
Primary Air Location: **Below firebox**
Dimension of Primary Air: 9 triangles @ base 20mm, height 50mm **zero when fully closed**
Area of Primary (mm^2): **4500mm^2**
Secondary/Tertiary Air Location: **Each side of firebox 120-230mm below baffle**
Dimension of Secondary/Tertiary Air: **12 holes @ 6mm in each side**
Area of Secondary/Tertiary Air (mm^2): **678.7mm2**
Baffle Plate size: **760×280×30mm Compressed Vermiculite**
Flue Dimensions: **200mm**
Spigot Dimensions: OD: **208mm** ID: **202mm**
Spigot to Side of Appliance: **300mm**
Rear Internal to External Heat Shield: **None**
Firebox to Side External Heat Shield: **None**
Heat Shield Material Type: **None**
Water Heater Fitted: **None**
Fan Location/Speeds: **None**
Catalytic Combustor fitted: **None**
Grate: **Yes**
Ash Pan: **Yes**
NOTE: Accuracy of measurement is ±5% of the measured value

7. CONCLUSION

The Lacunza Nickel 800 Free-Standing appliance installed with a Flo-met SG-FLKIT 200-FS-B 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 position shown in Figure 1 of this report in accordance with Appendix B of AS/NZS2918;2018.

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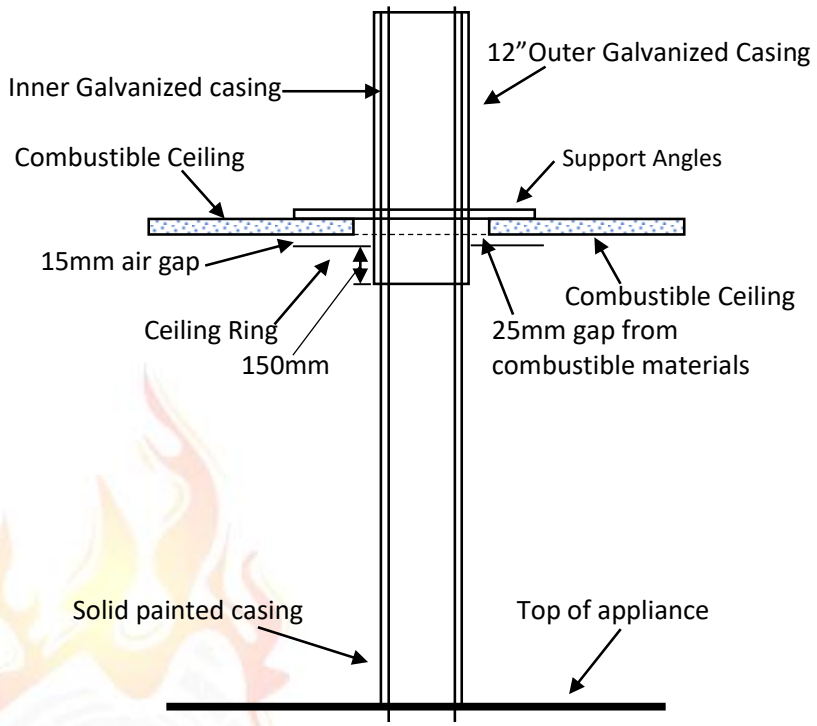
APPENDIX 1:

Flue kit – 8" stainless steel active with 10" painted casing below ceiling. 10 & 12" galvanized casings above the ceiling



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