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

PREPARED FOR

LACUNZA

THERMAL CLEARANCE TESTING OF THE LACUNZA LOIRE 1000 FREE STANDING APPLIANCE

Report Number: ASFT24058-PRELIMINARY REPORT
Issue date: 19 June 2024

By:
Garry W. Mooney

Report Distribution

POLIGONO INDUSTRIAL IBARREA S/N
31800 ALSASUA / NAVARRA
SPAIN
IDENTIFICACION FISCAL (TVA): ES/A31606932

ASFT Report Archive

Revision Details

Revision	Date	Comments
0	19/06/2024	Preliminary report – awaiting payment and engineering drawings of appliance

THERMAL CLEARANCE TESTING OF THE LACUNZA LOIRE 1000 FREE-STANDING APPLIANCE

Report

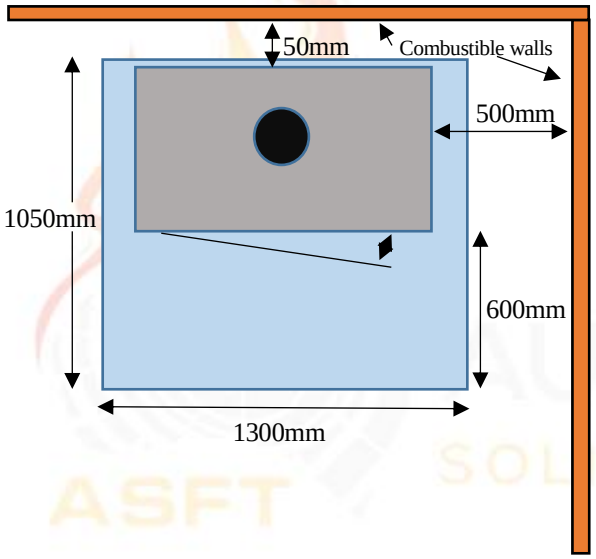
The Lacunza Loire 1000 Free Standing Appliance installed with a Flo-met SG-FLKIT 200-FS-B Flue Kit was tested in two positions in a manner conforming to joint Australian/New Zealand Standard 2918:2018, Appendix B.

The appliance was raised 25mm above the hearth. A minimum 1050mm deep x 1300mm wide x 50mm thick floor protector (Skamol 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 600mm in front of the appliance door and be placed centrally in the 1300mm width. The Thermal resistivity of the floor protector is 0.25m².K/W for 50mm thick skamol board.

The Lacunza Loire 1000 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



Position B – Corner position

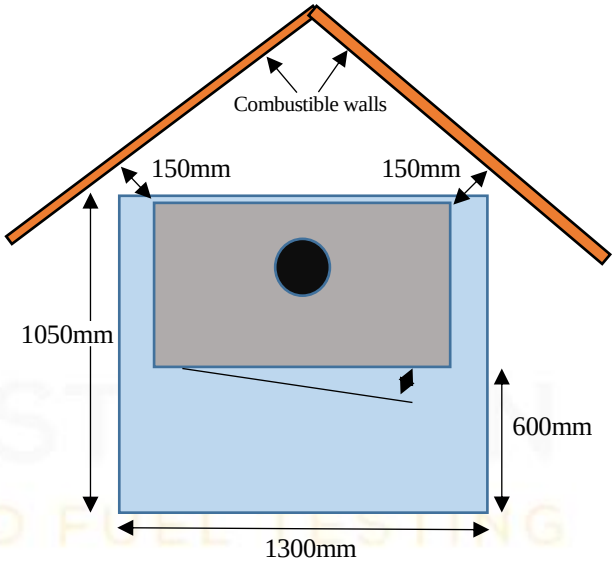


Figure 1 – Clearance Diagram

Signed		**Approved**	
Name	Garry W. Mooney	**Name**	Steve Marland
Title	*Technical Officer*	**Title**	*Managing Director – Australian Solid Fuel Testing*
Date	19/06/2024	**Date**	19/06/2024

1. INTRODUCTION

Thermal Clearance testing of the Appliance and flue system took place on 17 and 18 June 2024 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 – 1011mm from corner, 1965mm above the floor
9	Floor – 150mm in front of centre	24	Rear wall – 1044mm from corner, 795mm above the floor
10	Floor – Centre of flue	25	Rear wall – 836mm from corner, 562mm above the floor
11	Floor – 150mm behind centre	26	RHS wall, 855mm from corner, 429mm above the floor
12	Floor – 300mm behind centre	27	RHS wall, 272mm from corner, 961mm above the floor
13	Floor – 450mm LHS of centre	28	RHS wall, 351mm from corner, 468mm above the floor
14	Floor – 300mm LHS of centre	29	Rear wall – 1154mm from corner, 555mm 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 – 836mm from corner, 563mm above the floor
20	Ceiling Ring – 25mm in front	26	RHS wall, 1099mm from corner, 634mm above the floor
21	Ceiling Ring – Inner side	27	RHS wall, 867mm from corner, 791mm above the floor
22	Ceiling Ring – 25mm to side	28	RHS wall, 945mm from corner, 824mm above the floor
23	LHS wall – 791mm from corner, 751mm above the floor	29	LHS wall, 827mm from corner, 785mm above the floor
24	LHS wall – 910mm from corner, 582mm 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 13.5% moisture. Each firewood piece was 230mm x 90mm x 40mm.

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 12.5kg with an average refuelling rate of 1.3kg/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 9.1kg.

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	10.1 – 24.5	14.5 – 25.1
B	10.0 – 19.8	13.4 – 24.9

Maximum Surface Temperature Rise above Ambient - Position A

Position	Thermocouple Number	High Fire Test (°C)	Thermocouple Number	Flash Fire Test (°C)
Floor	3	46.8	3	53.5
Ceiling	19	29.6	19	29.5
Rear Wall	24	55.6	24	49.0
Side Wall	26	62.9	26	64.5

Maximum Surface Temperature Rise above Ambient - Position B

Position	Thermocouple Number	High Fire Test (°C)	Thermocouple Number	Flash Fire Test (°C)
Ceiling	19 & 20	30.4	19	33.1
RHS Wall	26	37.8	26	42.1
LHS Wall	23	39.7	24	66.7

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: **Loire 1000**		Serial No: **3046100000**
Manufacturer: **Lacunza**		
Overall Height: **570mm**	Overall Depth: **450mm**	Overall Width: **990mm**
Top Plate Width: **990mm**	Top Plate Depth: **450mm**	Top Plate Thickness: **2.0mm**
Usable Firebox Height: **160-338mm**	Width: **900mm**	Depth: **311mm**
Usable Firebox Volume: **69.70 Litres**		
Firebox Material Type/Seam Fully Welded: **3mm steel, seams fully welded**		
Firebrick Type: **Fully lined with vermiculite**		
Main Door Opening Height: **320mm**	Width: **897mm**	
Door Height: **530mm**	Width: **960mm**	Depth: **30mm**
Door glass Height: **510mm**	Width: **960mm**	
Primary Air Location: **Below door**		
Dimension of Primary Air: **2 slots @ 20-45 x 50mm + 3 slots @ 10-12 x 15mm (low burn setting 2 slots @ 8-20 x 50mm)**		
Area of Primary (mm^2): **3250 + 495 = 3745mm^2 (1400mm^2 on low burn setting)**		
Secondary/Tertiary Air Location: **Rear wall of firebox**		
Dimension of Secondary/Tertiary Air: **36 holes @ 5mm**		
Area of Secondary/Tertiary Air (mm^2): **706.95mm^2**		
Baffle Plate size: **300 x 940 x 30mm vermiculite**		
Flue Dimensions: **203mm**		
Spigot Dimensions	OD: **226mm**	ID: **204mm**
Spigot to Rear of Appliance: **95mm**		
Rear Internal to External Heat Shield: **100mm**		
Firebox to Side External Heat Shield: **15mm**		
Heat Shield Material Type: **2mm painted steel**		
Water Heater Fitted: **No**		
Fan Location/Speeds: **2 x variable speed fans under firebox**		
Catalytic Combustor fitted: **No**		
Grate: **Yes**		
NOTE: Accuracy of measurement is ±5% of the measured value		

7. CONCLUSION

The Lacunza Loire 1000 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 positions shown in Figure 1 of this report in accordance with Appendix B of AS/NZS2918;2018.

APPENDIX 1:

Flue kit – 200mm stainless steel active with 250mm painted casing below ceiling. 250mm & 300mm galvanized casings above the ceiling