

Report 08/1754

February 19th, 2008

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Customer: Glen Dimplex (Australasia) Limited
PO Box 58473
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AUCKLAND

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Attention: Phil Allen

Safety Testing of the Hestia 2 Clean Air Freestanding Wood Burning Heater to AS/NZS 2918:2001

A sample of the Hestia 2 Clean Air freestanding wood-burning heater supplied by Glen Dimplex (Australasia) Ltd. was tested for compliance to the joint New Zealand/Australian Standard 2918:2001. Tests were carried out in accordance with Appendix B of the standard. The unit was tested without a water heater fitted. Rob Kay carried out the tests in our Beatty St. laboratory in February of 2008.

Accreditation

Laboratory Registration Number 395

This laboratory is accredited by International Accreditation New Zealand (IANZ). The tests reported herein have been performed in accordance with the terms of our accreditation. This accreditation does not extend to any opinions or any interpretations of test results contained in this report.



IANZ has a Mutual Recognition Arrangement (MRA) with the National Association of Testing Authorities (NATA), Australia, such that both organizations recognize accreditations by IANZ and NATA as being equivalent. Users of test reports are recommended to accept test reports in the name of either accrediting body.

1.0 Test Procedures

Tests were carried out using equipment and procedures specified in Appendix B of the joint New Zealand/Australian Standard 2918:2001.

In summary, the heater was installed in a test rig consisting of a back wall, a sidewall, a ceiling and a floor. The distances between the heater and the walls were adjusted to ensure compliance with the requirements of the standard. The heater was tested in the 'normal' orientation that is with the sides of the heater parallel to the walls of the test enclosure and also in a 'corner' configuration, that is with the sides of the heater at 45° to the walls of the test enclosure. The heater was tested with and without a flue shield for both configurations, and wood fuel was used throughout.

Thermocouples embedded in the surface of the floor, ceiling and walls were used to locate the hottest points on these surfaces. Additional thermocouples attached to surfaces of the test rig using the method specified in Section B8(b) of AS/NZS:2918 Appendix B were used to test the areas between the fixed thermocouples.

The standard requires that the heater be tested under high fire and flash fire conditions. During high fire operation the burner is operated with all controls set to give maximum heat output and is constantly refuelled to maintain the fuel chamber between 50 and 75% full. The heater doors are kept fully closed except during fuel additions. The flash fire test involves burning a single load of wood (the amount is that which occupies approximately 53% of the firebox volume). The doors may be left open or partially open if this leads to higher measured temperatures. Any other controls are also set to maximise the temperatures of surfaces adjacent to the heater. Some embers are removed prior to burning the flash fire load.

2.0 Details of the Heater and Installation

For details of the heater tested please refer to our report 07/1737. Details specific to the safety testing were as follows:

This heater was not fitted with a water-heating device for the testing reported here.

A 150mm flue was used for testing the heater, exiting through a Sheetmetal Fabricated Products 345mm square and 1.2mm thick reflective ceiling plate offset from the ceiling surface by 12mm.

A "Logaire" double skin flueshield was used during testing requiring a flueshield. This shield comprises a five-sided reflective stainless steel inner skin that is spaced off the five-sided outer skin at the rear and rear quarters by about 15-25mm. It rests against the outer shield for the 65mm width of its sides. The interior width of the flueshield is 205mm and its depth is 100mm. It is spaced off the flue by approximately 20-25mm. The flue shield is 1200mm long and is attached to brackets inserted in slots in the top heat shield just behind the flue spigot and riveted to the flue at the top.

The heater was installed directly on the exposed combustible floor during normal and corner configuration testing.

3.0 Test Results

The ambient air temperature (see Appendix 1, location 31) for all tests was not less 24.3°C and not greater than 33.3°C. Refer to Appendix 1 for details of reported thermocouple locations. The following are the test uncertainties:

Uncertainty in the temperature measurements	1°C
Uncertainty in the location of the thermocouples	3mm
Uncertainty in the fuel addition weights	2g
Uncertainty in fuel moisture content	1%

3.1 High Fire Condition

The heater was operated with the door closed. Lengths of untreated rough-sawn 100mm x 50mm *Pinus radiata* were added at approximately 10-minute intervals to the firebox so that the fuel chamber was maintained at between 50 and 75% full. The wood fuel moisture content was between 10 and 20% on a wet weight basis.

Maximum temperature rises on surfaces of the test rig were obtained with the air control set to maximum.

The heater was fuelled at regular intervals until it was apparent that the maximum temperature rises above ambient had been obtained on the surface of the test rig. These are reported below.

After sufficient embers had been removed from the firebox to bring the fire bed volume to a level between 15 and 25% full by volume, the flash fire load was placed at random on the fire.

Temperatures given below are the maximum temperature rise above ambient obtained on surfaces of the test rig during flash fire operation.

Normal Orientation with Flue Shield Fitted

Location	Peak Rise (°C) Above Ambient	Channel	Date
Side wall	58.6	25	20.02.08
Rear wall	80.5	18	20.02.08
Ceiling	65.4	13	20.02.08

Normal Orientation without Flue Shield Fitted

Location	Peak Rise (°C) Above Ambient	Channel	Date
Side wall	53.3	26	21.02.08
Rear wall	68.7	18	21.02.08
Ceiling	50.9	13	21.02.08

Corner Configuration with Flue Shield Fitted

Location	Peak Rise (°C) Above Ambient	Channel	Date
Wall	63.1	19	20.02.08
Ceiling	73.6	13	20.02.08

Corner Configuration without Flue Shield Fitted

Location	Peak Rise (°C) Above Ambient	Channel	Date
Wall	81.2	18	21.02.08
Ceiling	52.8	14	21.02.08

Hearth/Floor Test

Location	Peak Rise (°C) Above Ambient	Channel	Date
Under Heater	55.8	2	20.02.08
Exposed Floor	50.5	8	20.02.08

3.3 Minimum Wall Clearances

Normal Orientation

Where the sides of the heater are parallel to the walls of the test rig. The side and rear walls were at the following distances (in mm) from the heater:

Clearances Measured From:	Side	Rear
With flue shield fitted	340	50
Without flue shield fitted	340	270

Corner Orientation

Where the sides of the heater are at 45 degrees to the walls of the test rig. The side and rear walls were at the following distances (in mm) from the heater corners of the heater top plate:

Clearances Measured From:	Corner
With flue shield fitted	25
Without flue shield fitted	150

We note that AS/NZS2918 places additional constraints on clearances with regard to access (section 3.2.1) and also for materials of abnormally high heat sensitivity (section 3.2.2).

3.4 Hearth Requirements

The heater was tested without a hearth or floor protector present, and compiled with the requirements of the standard where no temperatures on the exposed floor exceeded the specified limits. We note however that AS/NZS2918 places minimum requirements on floor protector construction where the floor area on which the heater is to be installed includes heat sensitive materials under or within 500mm of the appliance (see Section 3.3 of the standard).

4.0 Compliance

Section B10 of the joint Australian/New Zealand Standard 2918:2001 states that to comply with the temperature limits of the Standard, the temperature rise above ambient temperature of monitored surfaces shall not exceed 65°C during the high fire test and 85°C during the flash fire test.

On the basis of the results given above the unit tested complies with the requirements of the joint Australian/New Zealand Standard 2918:2001 for heat sensitive surfaces on the walls, ceiling and floor when installation and clearances are as specified in this report.

We note according to Section 3.3 of the Standard that if the appliance is installed on or within 500mm of heat sensitive materials in the floor then a floor protector will be required. This floor protector shall extend under the appliance and not less than 300mm beyond the front of the fuel loading or ash removal openings. The width of the floor protector shall be not less than the width of the appliance, and shall extend not less than 200mm from each side of the fuel loading or ash removal openings unless it forms an abutment with a wall or heat shield at a lesser distance.


The report relates only to the item tested. Any subsequent modifications to the equipment as tested will invalidate the compliance test results.

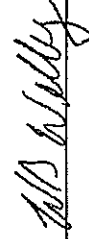
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