

Report 05/1160

May 23rd, 2005

Page 1/6

Customer: Masport Ltd.
P.O. Box 14-349
Panmure
AUCKLAND

Attention: Agron Haraqia

Same as Talisman
Safety Testing of the Gusto Wood Burning Heater

A sample of the Gusto freestanding heater supplied by Masport 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 May of 2005.

Accreditation

This laboratory is accredited by International Accreditation New Zealand (formerly Telarc). 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.



Laboratory Registration Number 395

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 fitted 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 refueled 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

Full details of the Gusto can be found in either of our reports 05/1128 or 05/1129. Specific safety testing information is as follows:

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

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

A single skin, semi-circular, stainless steel flue shield with a reflective inner surface was used for relevant testing. The flue shield was 1200mm high, and was installed with two flue-mounted straps so that the bottom edge of the flue shield was at the same level as the top of the flue spigot. The flue shield was spaced off the fluepipe by approximately 25mm.

3.0 Test Results

The ambient air temperature (see Appendix 1, location 31) for all tests was not less 17.1°C and not greater than 23.1°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 fueled 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.

Floor temperatures under the heater were measured along two lines crossing beneath the centre of the heater and beneath the pedestal of the heater, where it made contact with the floor. The exposed floor temperatures were measured in front of the heater.

Average Fuel Usage at Maximum Output: 81.2g/minute (4.87kg/hour)

Normal Orientation without Flue Shield Fitted

Location	Peak Rise (°C) Above Ambient	Channel	Date
Side wall	82.2	24	18.05.05
Rear wall	82.9	18	18.05.05
Ceiling	62.1	14	18.05.05

Normal Orientation with Flue Shield Fitted

Location	Peak Rise (°C) Above Ambient	Channel	Date
Side wall	76.7	23	05.05.05
Rear wall	80.0	18	05.05.05
Ceiling	69.8	12	05.05.05

Corner Configuration without Flue Shield Fitted

Location	Peak Rise (°C) Above Ambient	Channel	Date
Wall	82.7	18	18.05.05
Ceiling	68.8	12	18.05.05

Corner Configuration with Flue Shield Fitted

Location	Peak Rise (°C) Above Ambient	Channel	Date
Wall	74.0	18	06.05.05
Ceiling	58.6	12	06.05.05

Hearth/Floor Test

Location	Peak Rise (°C) Above Ambient	Channel	Date
Under Heater	38.0	4	18.05.05
Exposed Floor	69.3	8	05.05.05

3.3 Minimum Wall ClearancesNormal 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
Without flue shield fitted	450	500
With flue shield fitted	325	125

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 corners of the heater top plate:

Clearances Measured From:	Corner
Without flue shield fitted	350
With 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 floor protector or insulating hearth present, and complied with the requirements of the standard where no temperatures on the exposed floor exceeded the specified limits. We note however that AS/NZS 2918 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.



Any modifications to the equipment as tested may invalidate the compliance results.

This report:

Prepared by: C.J. Mildon

Approved by: C.J. Mildon

Release Date:



23-05-05

This report must not be reproduced except in full. Results are based on materials and information supplied by the client. Applied Research Services Ltd shall not be liable in respect of any loss or damage (including consequential loss or damage) resulting from use of reports prepared by them. Results issued in electronic form are subject to confirmation by issue of a final written report.