



RECOHEAT TEST REPORT

FCP 6.02

RECOHEAT – HEATING FROM THE HEART
Initial type testing for Recoheat
Heat Recovery Units
Published October 2020



Recoheat Test Report

Contents

1.0 Introduction	1
1.1 Designation of the unit.....	1
2.0 Calibration of test equipment	1
3.0 Compliance testing	2
3.1 Components	2
3.2 Production tests	2
3.2.1 Coil shape integrity test.....	2
3.2.2 Coil tensile strength.....	2
3.2.3 Paint application.....	3
3.2.4 Heat test	3
4.0 Performance	4
4.1 Chimney draw test.....	4
4.2 Chimney heat, draw and recovery test.....	4
Statement of conformity	5

1.0 Introduction

These test processes were undertaken to determine the safety and compliance of the Recoheat heat recovery units produced for sale by Recoheat Ltd.

These tests were undertaken to fulfil the requirements of regulations **BS EN-1856-2-2009**.

1.1 Designation of the unit

For the purpose of the regulations, the Recoheat is considered a rigid flue section.

The addition of the coil is performed under the terms assigned to a baffle plate, and fall within the parameters defined therein that they should not obstruct more than 50% of the flue section. The Recoheat in fact obstructs no more than 25% of the flue section of a 125mm flue.

2.0 Calibration of test equipment

Test equipment is calibrated according to the processes defined in **FCP 6.01 In-house Calibration** and results are recorded in the form **FCP FO: 04.10 Calibration Equipment Record**.



3.0 Compliance testing

3.1 Components

Flue section

Steel tube

Silicone tube

High temperature paint

There are only two in-flue components of the Recoheat units: the flue section manufactured by a third party and meeting regulatory standards, and the steel coil. All components are tested by their respective manufacturers, and their quality assured by the production of their certificates of conformity in accordance with **FPC QP 05.01** and enacted in accordance with **FPC FO: 04.05**

All metal components of the Recoheat units are manufactured in 316 stainless steel, 1mm thick.

Test result: Passed.

3.2 Production tests

The elements of production that require testing are the shape and proportions of the coil, the integrity of the weld securing the coil to the flue, including the tensile strength of the coil in the flue, and the quality of the paint application.

Please note that the integrity of the weld securing the coil to the flue section impacts on the rigidity of the product for practical and aesthetic reasons only, and does not affect the safety or conformance requirements of the component. Conformance does not require this element to be welded or secured in order to meet the standards.

3.2.1 Coil shape integrity test

Coil measurements are marked on the production jig and verified by a height measurement. Small variations in form are acceptable, and the jig prevents significant variation of the only proportion that affects the function of the coil, which is the central gap in the coil. As this is achieved by wrapping the coil around the steel shaft of the jig, this key space cannot be impinged on in a way that would obstruct the passage of a chimney brush through the coil.

Test result: Passed.

3.2.2 Coil tensile strength

A test was made of the tensile strength of the weld joining the coil to the flue to ensure the coil cannot be loosened in transit or by the stress of passing a chimney brush through it.

2.5Nm of pressure was applied to the extreme end of the coil by placing the flue section in a horizontal position and suspending a 1kg weight from the end of the coil. The flue was then rotated so that any movement in the coil would be apparent. The coil could not deviate from the horizontal or exhibit any movement.

Test result: Passed.



3.2.3 Paint application

Testing for the quality of the paint application is purely visual as the paint does not offer any construction or safety enhancements.

The flue section was placed in front of a black background under good lighting and rotated so that any blemishes in the black paint were highlighted against the background.

Test result: Passed.

3.2.4 Heat test

Tester: Will Burrows. Date: 19/10/20

Equipment: Comark KM330 Thermometer

This test was undertaken to ensure the integrity of the coil weld. The test was undertaken with a 125mm diameter unit fitted to a single-to-double-skin adapter passing straight into a double-skin flue of 2m, topped with a wind cowl.

The stove was heated to a maximum output with wood for one hour, then allowed to cool. The integrity of the coil was then tested by accessing it from the stove and inserting a sweeping rod into the coil and attempting to move it.

Maximum temperature of coil after 60 minutes: 624°C

Test result: Passed.

3.2.5 Appliance air leakage test

Tester: Will Burrows. Date: 20/10/20 External temperature: 12°C Temperature in room: 15°C

The smoke pellet employed for this test is an Arctic 5g encapsulated smoke pellet, model number PH530/SF producing 15m³ of smoke in 30 seconds.

The smoke alarm used for the test was a Kidde model 10Y29. The smoke alarm was situated 2.5 metres from the stove at a height of 1.5 metres above the top of the stove.

The thermometer used is a Comark KM330.

The appliance air leakage test was conducted with an unlit stove.

The stove was warmed to 40°C with a heat gun

An Arctic 5g smoke pellet was added to the stove, lit, and the door and vents closed.

A visual check was made that no smoke was escaping from the Recoheat unit or the stove.

The smoke alarm was used to verify the visual check.

No smoke was observed escaping from the Recoheat unit or from the stove, and no alarm was triggered from the smoke alarm.

Test result: Passed.



4.0 Performance

We define compliance performance as tests to determine that the Recoheat unit does not adversely affect the performance of the flue in which it operates with particular regard to the temperature of the flue and the draw of the flue.

4.1 Chimney draw test

Tester: Will Burrows. Date: 29/10/20 External temperature: 10°C Temperature in room: 15°C

The chimney draw test was designed to compare draw values with and without a Recoheat unit fitted to a chimney. In order to minimise the effect or likelihood of external variations such as wind speed, atmospheric pressure, temperature etc impacting the comparison, the tests were each done after a 15-minute kindling burn each. After the first burn, the kindling was allowed to burn out, then was removed so that the flue could cool and the Recoheat could be fitted.

The chimney was tested through a flue hatch access point secured against air leakage by a padded, heat-proof section (soldering mat) secured with a steel plate.

The gauge used is a Wohler DM2000 Draught Gauge.

The thermometer used is a Comark KM330.

The height above the flue collar was 500mm without the Recoheat fitted and 570mm with the Recoheat fitted.

The external air temperature was 15°C Temperature in room: 18°C

Without Recoheat unit

The external air temperature was 15°C Temperature in room: 18°C

Reading: 14

With Recoheat unit present but switched off

The external air temperature was 15°C Temperature in room: 18°C

Reading: 14

With Recoheat unit present and switched on

The external air temperature was 15°C Temperature in room: 18°C

Reading: 14

4.2 Chimney heat, draw and recovery test

Tester: Will Burrows. Date: 29/10/20 External temperature: 10°C Temperature in room: 16°C

This test was designed to compare the heat of the flue above and below the Recoheat when the Recoheat was switched on and off in order to determine whether the Recoheat itself, or the Recoheat with air pumping through it, would affect the heat and the draw of the flue.

For the test, the inspection/cleaning hatch in the 1 metre single-skin flue section above the Recoheat was removed and replaced with a soldering mat secured with a steel plate which in turn was held in position with a single 1mm steel wire.

The steel plate and heat pad are pierced with a 6mm hole at a height of 590mm above the stove top. The hole has the same diameter as the manometer probe. The probe passes through the hole, effectively sealing it and allowing accurate draught readings to be taken.

Date: 30/10/2020

Page 4 of 5

Issue:001



The manometer probe is removed and allows the thermometer probe to be inserted into the chimney so that the temperature of the flue gases can be taken.

Equipment:

Thermometer: Comark KM330.

Manometer: Wohler DM2000 Draught Gauge.

Method: A fire was lit in the stove using the materials listed, and the Recoheat switched on.

At the timed intervals, the temperature was taken at three points:

On the surface of the stove, 80mm in front of the flue

In the nozzle of the Recoheat at 70mm above the stove top

In the access hole at 590mm above the stove top.

At each interval, two sets of readings were taken – one with the Recoheat switched on, and one with the Recoheat switched off.

The whole process took about two minutes per cycle, so there is some variation in the timing of the readings. This was considered unimportant because the readings themselves are not important, but rather their relation to each other.

In the table below, two readings are provided for the flue gas and draught readings. The first is with the Recoheat switched on, and the first with the Recoheat switched off. After the latter reading is taken, the Recoheat was switched back on.

Weight of kindling: 437g

Combined weight of 4 small logs laid in upside down fire configuration (with the kindling on top) 1058g

Moisture content of wood: maximum 18%

Time from ignition	Temperature of top of stove	Temperature of Recoheat air flow	Temperature of flue gases	Draught
5 minutes	190	404	590/592	18/18
10 minutes	236	335	355/354	18/18
15 minutes	242	294	385/391	18/18
30 minutes	289	407	465/467	18/18

Statement of conformity

These tests were undertaken by Will Burrows on the 20th October 2020, and are declared by him to be true and accurate.

Signed: Will Burrows



Role: Managing Director, Recoheat Ltd

