

SAP PCDB data entry guidance – Flue Gas Heat Recovery Systems

Test Data and Information Required for Recognition

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Version 1.3

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1 Introduction

This document provides a description of the data requirements for a PCDB Flue Gas Heat Recovery System (FGHRS) application. It is written to accompany Kiwa's report¹ on the lab test data required and the calculation used to process this, by relating the lab test data to the application forms and processes used for PCDB applications. It provides guidance on how to fill in the application form (administrative information) and declaration form (performance data).

1.1 Types of FGHRS

A FGHRS consists of a number of components to recovery heat from a boiler's flue products to preheat incoming cold water when hot water is drawn. There are several sub-types:

- **PFGHRD** - Passive Flue Gas Heat Recovery Devices are FGHRS that are encased (i.e. a single device) and do not use fuel or electricity.
- **Storage FGHRS or PFGHRD** – these contain a heat store enabling them to to recover heat during space heating operation to later preheat the incoming domestic cold water when hot water is drawn.
- **Non-storage FGHRS or PFGHRD** – these do not contain a heat store to recover heat during space heating operation, so heat can only be recovered while hot water is drawn.
- **Integral PFGHRD** – These are contained within and sold as part of the boiler. The boiler and PFGHRD package must have a unique boiler name for entry for inclusion in the PCDB and for easy identification by Energy Assessors.
- **Non-integral PFGHRD** – These are separate devices that many be added to any suitable boiler and are sold separately. The PFGHRD has a unique name for entry in the PCDB and for easy identification by Energy Assessors.

1.2 Identification and Declaration forms

In relation to product recognition, manufacturers should complete the form: "Application for recognition of product data within an existing SAP technology category"² and the declaration form in Appendix A of this document. Please attach these forms as part of your FGHR application.

¹https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1019672/review-methodology-fghrs-sap.pdf

²<https://www.ncm-pcdb.org.uk/sap/filelibrary/pdf/Applications/Application-for-recognition-of-product-data-within-an-existing-SAP-technology-category-V5.pdf>

2 Thermophysical properties

The thermal and physical properties required for entry in the PCDB can be found below. Please fill out the table below. Alternatively, you may include data in an appropriate test report format. Please include this as part of your application.

Entry Name	Entry Value
Weight of heat exchanger(s) in kg to the nearest 0.1 kg.	
Total Volume of water/condensate in the heat exchanger(s) in litres (include both primary and secondary water) the nearest 0.1 litre.	
Specific thermal capacity of the heat exchanger(s) material(s) in kJ/kg/K (3 decimal places).	
If separate store, the volume of hot water (DHW) in the store in litres to the nearest 0.1 litre.	
Volume of DHW in heat exchanger in the store in litres to the nearest 0.1 litre.	
Specified maximum total length (m) and diameter (mm), insulation conductivity (W/m/K) and thickness (mm) of connecting pipework between store and heat exchanger; to three decimal places, apart from measurements in mm which are to the nearest mm.	
Specified minimum height (mm) between the store's highest domestic water level and the highest water level in the heat exchanger.	
Properties of the new instantaneous combi boiler (no "keep-hot" facility) used in the tests	
Boiler name and model	
Minimum firing input rate in central heating mode (kW net to the nearest W).	
Maximum heat output rate in central heating mode (kW to the nearest W).	
BED Declared Efficiency at full and 30% part load (to the nearest 0.1%).	

3 Test Descriptions

Laboratory tests are required to characterise the key properties of the FGHRs.

The tests are:

- Test 1: Charging test
- Test 2: Cooling test
- Test 3: Discharging test
- Test 4: Summer hot water tests (with and without FGHRs)

Excel spreadsheets (or compatible format – e.g. CSV) should be provided containing the datasets relating the lab tests described in Appendix C of Kiwa's report.

Entry Name	Options	Entry value
Identification		
Is the FGHR device integrated into a specific boiler?	(Y/N)	
Has the "Application form for product under an existing category" form been completed?	(Y/N)	
Thermophysical properties		
Has all the information requested in the "Thermophysical properties" section been included in the application?	(Y/N)	
Laboratory Data		
Is the cooling data being provided in recommended spreadsheet format?	(Y/N)	
Is the charging data being provided in recommended spreadsheet format?	(Y/N)	
Is the discharging data being provided in recommended spreadsheet format?	(Y/N)	
Has the relevant summer hot water test report(s) been included in the application?	(Y/N)	

Applications incorporating all required documents including this declaration form should be sent electronically to: saproductlisting@bre.co.uk

By signing this form, I declare that all the other information included in my returns are correct.

Name of Company/Organisation:

Address:

Signed on behalf of Organisation:

Please also print name:

Position:

Date

Appendix B Treatment of historical data on the PCDB

The following test criteria are considered acceptable for the historical entries already in the PCDB to enable them to be used in the new calculation procedure described in Kiwa's report. As a comparison, the requirements for new entries (described in detail in Kiwa's report) are shown in brackets.

- 1) An ambient temperature of less of than 25°C throughout the test (the new condition is 20°C±2°).
- 2) A measurement frequency of at least every 15s for charge, discharge and cooling tests (new condition is 1s for the discharge test).
- 3) An average of the flow and return temperature during the charging test of 50±2°C (new condition is an average flow temperature of 53±2° and an average return temperature of 47±2°C).
- 4) Flue gas temperature measurements before and after the FGHRs in the charging and discharging tests – these were not used originally but were asked for in case there was a dispute. They are now necessary for the new method to calculate Uch and Uch2.
- 5) Heat output measured during the charging test.
- 6) Maximum boiler heat output in heating mode. This is required by the new method to work out the hours of operation for a given heat requirement.
- 7) The boiler may be fired during the discharge test (new conditions require the boiler to be off during the discharge test)
- 8) There is a defined starting point for the discharging and cooling shown by the data (this has been tightened in the new method).

Note: If manufacturers of previously listed products choose to submit data tested to the new test conditions this data will be used instead of the historical data.

Appendix C Additional Notes

(We will add further notes here in response to questions or comments received. Please email saproductlisting@bre.co.uk if you have any feedback)