



MICROGENERATION PRODUCT STANDARD: MCS 015

MCS Product Certification
Scheme Requirements:

Electricity-led micro-cogeneration packages or add-on
unit

This Standard has been approved by the Standards Management Group of the Microgeneration Certification Scheme.

This Standard was prepared by the Microgeneration Certification Scheme Working Group 9 'Micro-CHP systems.

REVISION OF MICROGENERATION CERTIFICATION STANDARDS

Microgeneration Standards will be revised by issue of revised editions or amendments. Details will be posted on the website at www.mcscertified.com

Technical or other changes which affect the requirements for the approval or certification of the product or service will result in a new issue. Minor or administrative changes (e.g. corrections of spelling and typographical errors, changes to address and copyright details, the addition of notes for clarification etc.) may be made as amendments.

The issue number will be given in decimal format with the integer part giving the issue number and the fractional part giving the number of amendments (e.g. Issue 3.2 indicates that the document is at Issue 3 with 2 amendments).

Users of this Standard should ensure that they possess the latest issue and all amendments.

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FOREWORD

The following document contains provisions which, through reference in this text, constitute normative or informative provisions of this document MCS 015. At the time of publication, the editions indicated were valid. All documents are subject to revision, and parties applying this document MCS 015 are encouraged to investigate the possibility of applying the most recent editions of the documents referenced.

The following document (MCS 015 Issue 2.0) is a major update to MCS 015 Issue 1.2. It is available for reference from the date of publication (12/11/2018).

Newly certified products shall comply with (MCS 015 Issue 2.0) from the date of publication (12/11/2018). Issue 2.0 is mandatory from 12/11/2019 for manufacturers or importers who have products currently certified to Issue 1.2.

1. INTRODUCTION

This scheme document identifies the evaluation, assessment requirements and practices for the purposes of certification and listing of Electricity-Led Micro-Cogeneration Packages. Certification and listing of Packages is based on evidence acceptable to the Certification Body:

- that the Package falls within the scope of this scheme document;
- that the certificate holder has staff, processes and systems that have been audited by MCS in accordance with MCS 010 in place to ensure that the package placed on the market meets the requirements of this scheme document,

And on:

- periodic audits of the certificate holder including testing as appropriate;
- compliance with the contract with the Certification Body for listing and certification including agreement to rectify faults as appropriate.

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2. SCOPE

This Scheme provides ongoing independent, third party assessment and approval of Electricity-Led Micro-Cogeneration Packages designed and intended for installation in residential and commercial buildings, where the Package/add-on unit:

- a) has a thermal and electrical output of less than 45 kW_t or 50 kW_e respectively,
- b) is fuelled by any of the following – second and third family gas; gas from a bespoke source; hydrogen; mineral oil; other liquid fuels, principally bio-oils; other fuels including unconventional fuels and solid fuels,
- c) is intended to maximise electricity production in response to an electrical demand.
- d) All the cogenerated heat recovered will be made use of.

3. NORMATIVE REFERENCES

The following referenced documents are indispensable for the application of this scheme document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

- PAS 67: 2013, or the latest available version thereof:

Laboratory tests to determine the heating and electrical performance of heat-led micro-cogeneration packages primarily intended for heating dwellings.

Note: In addition to the PAS 67 requirements, the package is also controlled by a simulated electrical load. This overrides the heat demand signal requirement within PAS 67.

- G83/2: August 2012, or the latest available version thereof:

Recommendations for the connection of small-scale embedded generators (up to 16A per phase) in parallel with Public Low-Voltage Distribution Networks.

- G59/3: June 2014, or the latest available version thereof:

Distributed Generation Connection Guide – A guide for connecting generation to the distribution network that falls under G59/3.

- Commission regulation (EU) no 811/2013

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- Commission regulation (EU) No 812/2013

- Product Characteristics Database

See: <http://www.ncm-pcdb.org.uk/sap/searchpod.jsp?id=17>

- CEN/TR 1749: 2005, or the latest available version thereof:

European Scheme for the classification of gas appliances according to the method of evacuation of the combustion products (types).

4. DEFINITIONS

4.1 ELECTRICITY-LED MICRO-COGENERATION PACKAGE

- An Electricity-Led Micro-Cogeneration Package whose prime mover is intended primarily to generate electricity and produces heat as a by-product.
- Installation and operation of a Micro-Cogeneration Package within a building resulting in:
 1. Electricity production exceeding or contributing to the building’s annual requirements, and
 2. Thermal production equal to or less than the building’s annual requirements, as tested in accordance with Annexes 1 - 3.

4.2 COGENERATION UNIT

A Unit that is capable of cogeneration.

4.3 COGENERATION

Combined generation of electricity and heat by an energy conversion system and the concurrent use of electric and thermal energy from the conversion system.

4.4 ELECTRICITY-LED MICRO-COGENERATION UNIT

A lead Micro-Cogeneration Unit whose primary purpose is to generate electricity and whose secondary purpose is to generate heat. Unit is controlled so as to prevent heat being generated in excess of the building’s requirements.

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4.5 ADD-ON MICRO-COGENERATION UNIT

A lead unit added to or replacing part of a building's existing heating system which responds to a thermal or electrical demand signal and controls operation of the existing heating plant as necessary to meet the building's heat requirements.

Note 1: Ancillary items could include but would not be limited to, heat interface unit, Cylinder, hot water store, buffer vessel, pumps etc.

Note 2: where suitable existing controls are in place these may be re-used to control the add-On Micro-Cogeneration unit and existing plant.

4.6 ADD-ON MICRO-COGENERATION PACKAGE

A package that consists of an Add-On Micro-Cogeneration Unit together with its controls and ancillary items as supplied.

4.7 COMBIPK

Micro-Cogeneration Package for providing space and water heating in which the Domestic Hot Water (DHW) service is provided wholly from within the package.

4.8 DHWPK

Micro-Cogeneration Package for the provision of hot water heating alone for residential or commercial buildings.

4.9 COGENERATED HEAT

The cogenerated heat recovered after system losses.

4.10 HPER

The measure of environmental performance is the Heating Plant CO₂ Emission Rate (HPER) in units of kgCO₂/kWh

4.11 MICRO-COGENERATION PACKAGE

Micro-Cogeneration Package is a group of components and equipment, which, when installed in accordance with the manufacturer's specification, using the manufacturer's / producer's Micro-Cogeneration Unit and is supplied for testing, produces sufficient electrical energy to partially or

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wholly satisfy the electrical and thermal demands of the building and may produce an excess of electrical energy that can be exported to the grid.

A thermal and electrical output of less than 45 kWt or 50 kWe respectively suitable for connection in parallel with the UK public low voltage distribution network in accordance with G83/2 or G59/3.

Note: Manufacturer is the organisation that submitted the Package for testing.

Important note: Whilst the manufacturer may supply a Package for testing, they may only market a unit and specify what components the MCS Contractors needs to source to comprise the Package, the specification of these components are to be detailed in the producer's instruction manual and approved by the Certification Body.

4.12 CERTIFICATE HOLDER

For the purposes of this scheme document, a certificate holder is:

- a manufacturer of a Micro-Cogeneration Unit or Package selling under his own brand in the UK; or
- a business based in the UK selling under his own brand (or another brand under licence) a Micro-Cogeneration Unit or Package manufactured by another business; or
- a professional importer introducing a Micro-Cogeneration Unit or Package to the UK market.

4.13 SYNCHRONOUS MODE

Operation of a Micro-Cogeneration Package connected to a public alternating current (AC) electricity distribution network and capable of exporting electrical power to it.

5. APPLICATIONS TO JOIN THE SCHEME

Applications should be made to an MCS Certification Body licensed to operate this scheme. The Certification Body will provide the appropriate application form and details of the applicable fees.

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6. MANAGEMENT SYSTEMS CERTIFICATION

Manufacturers shall operate a certified documented manufacturing quality control system, in accordance with the requirements of MCS 010 “Factory Production Control Requirements”.

7. CERTIFICATION AND APPROVAL OF THE MICRO-COGENERATION PACKAGE

This section sets out the criteria against which the Certification Body will assess the Micro-Cogeneration Package as suitable for certification and approval together with some supplementary explanatory notes.

7.1 ACCEPTANCE CRITERIA

Acceptance of documented evidence will be at the discretion of the Certification Body providing the certification, but at least the following criteria shall be applied:

- a. Evidence of compliance with conditions of the Scope of this scheme document
- b. Evidence of compliance with the relevant requirements of applicable European Directives and UK regulations
- c. Evidence of compliance with the technical requirements for connection and operation as a fixed Micro-Cogeneration Package when installed in parallel with the UK public low voltage distribution network (synchronous mode) in accordance with G83/2 or G59/3,
- d. Evidence of compliance with the performance criteria listed in § 9 of this scheme document
- e. Verification of the establishment and maintenance of the manufacturing company’s quality management system in accordance with the Factory Production Control Requirements (FPC) detailed in § 6 of this scheme document
- f. Satisfactory review of the technical documentation relating to the Package.

7.2 SUPPLEMENTARY EXPLANATORY NOTES

- Applications for a range of common Packages (Package families) will be dealt with on a case by case basis. For example, where one or more characteristics are the same for Packages with

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similar design, construction and functionality then the results of tests for these characteristics on one Package may be applied to other similar products.

- A certificate is awarded following demonstration of satisfactory compliance with this scheme document, i.e. Package performance; FPC; and technical documentation.
- Certificates contain the name and address of the manufacturer, model and reference number of the Micro-Cogeneration Package, a unique certificate reference number and the issue number and date.
- Certificates are valid from the date of issue and are maintained and held in force subject to satisfactory completion of the requirements for maintenance of certification (see § 10) but remain the property of the issuing Certification Body.
- Details of the manufacturer and the certificated product(s) are listed on the MCS website www.mcscertified.com

8. TECHNICAL DOCUMENTATION

The certificate holder may produce only the unit but have it tested with another component to create a package as in the case of a domestic hot water storage cylinder. As part of the instructions, the certificate holder will detail the specification of the other component in order that the installed Package is the same as the one tested.

Technical documentation for the Unit or Package must be submitted for review. This documentation shall be presented in English and shall be such that it can be assured that the package submitted for test is equivalent to those that are to be manufactured for normal production. The documentation must consist of the following as a minimum;

- a) Manufacturer's name,
- b) Brand name,
- c) Package or Unit name,
- d) Unique Package or Unit identifier – *shall not be the same as any other unit or package currently listed on the Product Characteristics Database or for a DHWPK listed on the MCS website,*
- e) Nominal rated heat output,
- f) Nominal maximum electrical output,

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- g) Electrical specification – *either 230V 50Hz synchronous single phase or 400V 50Hz synchronous three phase (3 wire or 4 wire)*
- h) Description of Package or Unit – prime mover – *(e.g. internal combustion engine, external combustion engine, fuel cell, or other (if other an amplified description is required), plus heat interface unit, (e.g. Heat recovery unit / thermal store), and the necessary controls,*
- i) Type of fuel used – *where fuel is unconventional a full description is required,*
- j) Whether condensing or non-condensing,
- k) Type of flue system – *designated in accordance with CEN/TR 1749*
- l) Details of intended use and application.
- m) A noise test report – *set out in accordance with § 9.1 c) of this scheme document*
- n) Manufacturing drawings and/or specifications including tolerances, issue and revision numbers necessary to establish the build status of the Unit or Package
- o) Raw material and components specifications necessary to establish the build status of the Package or Unit.
- p) Details of the quality plan applied during manufacture to ensure ongoing compliance,
- q) Where historical test data is requested to be considered for the application, full test report and details of any existing approvals (Note: each application will be dealt with on a case by case basis and further information about the acceptance of previous testing is available on request),
- r) Installation, use and maintenance instructions. Additional information for Add-On-MCP (See “Micro-Cogeneration Add-On-Test Package: Test methodology based on PAS 67:2013”),
- s) For Add-On Micro-Cogeneration Packages, reference test boiler type, output rating and SAP annual efficiency (%),
- t) For Add-On Micro-Cogeneration Packages providing space heating output at 100% load factor for the reference test package,
- u) For Add-On Micro-Cogeneration Packages or DHWPK providing hot water, DHW heating performance results and tapping cycle number(s).

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9. PERFORMANCE CRITERIA

For compliance with this Scheme, the Micro-Cogeneration Unit or Package must be able to demonstrate the listed performance criteria shown below. Evidence of compliance is generally accepted as independent third-party testing by a UKAS (or equivalent) accredited test laboratory. However, other evidence of compliance may be considered at the discretion of the Certification Body (see document MCS 011 'Testing acceptance criteria').

- a) An attributable, independently verified, energy performance report produced from the comprehensive set of test conditions detailed in the Annexes appropriate for the intended application of the Micro-Cogeneration Package,
- b) For DHWPKs the heating plant emission rate (HPER) for the Micro-Cogeneration Package must be less than the corresponding value in Table 1, Annex 1. For combiPK compliance can be demonstrated either; directly by the carbon emission value (C) or by the installer following evaluation of the installation dwelling by using the HPER method or by the SAP method, as detailed in Annex 2 of this document. For Add-On Micro-Cogeneration Packages the performance of the heating system shall be better than before installation, excluding standby results (see Annex 3).
- c) An attributable noise test report in accordance with MCS 011, and COMMISSION REGULATION (EU) No 811/2013, or COMMISSION REGULATION (EU) No 812/2013 at the maximum tapping water flow rate (*DHWPK's capable of tapping cycles 3XL and 4XL, shall be assessed at the maximum tapping water flow rate of tapping cycle XXL*).

9.1 ADDITIONAL PERFORMANCE CRITERIA

9.1.1 Combination heaters (as defined in COMMISSION REGULATION (EU) No 812/2013) shall meet the requirements of the following:

- COMMISSION REGULATION (EU) No 813/2013, Annex II, Clause 2,

9.1.2 DHWPKs shall meet the requirements of the following:

- COMMISSION REGULATION (EU) No 814/2013 Annex II Clause 1.1.

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10. MAINTENANCE OF CERTIFICATION AND LISTING

Certificates and listing are maintained and held in force subject to satisfactory completion of the following requirements for maintenance of certification:

10.1 FACTORY AUDITS

10.1.1 Certification is maintained through annual FPC quality system audits, which shall include a detailed check that the unit being manufactured is to the same specification as the unit tested.

10.2 PRODUCT AUDITS

Package audits will be conducted as follows:

Review of the product technical data files including materials;

Review of end of line tests in accordance with the manufacturer's quality plan;

In circumstances, justified by the Certification Body, repeat testing of elements from § 9.1a) of this scheme document to confirm that the Package continues to meet the minimum performance requirements for certification and listing.

11. CERTIFICATION MARK AND LABELLING

All approved Units and Packages listed under this Scheme shall be traceable to identify that they have been tested and certificated in accordance with the requirements of the test standard. See below for details.

The Supplier shall use the Certification Mark(s) only in accordance with their Certification Body's instructions.

An example of the Certification Mark(s) that can be used for this Scheme is as follows:

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From the 1st December 2019 the new MCS Certification Mark is available for use:



Prior to the 1st December 2019 but still in use until a product is phased out or a Manufacturer wishes to migrate over to the new Certification Mark



Certificate Number MCS "XXX",

"Description of the technology certificated"

Where "XXX" is the certificate number, and the logo of the Certification Body issuing the certification would sit on the right hand side of the logo.

Companies may only use the Mark while the certification is maintained.

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ANNEX 1: DHWPKs

Where a DHWPK consists of a prime mover (typically a fuel cell) which is intended only for the production of electricity and domestic hot water (i.e. not space heating) it shall be tested in accordance with this Annex 1 and the PAS 67 DHW-only test methodology in clause 12.7 of that Standard with the proviso that the definition of a DHWPK shall be extended to include hot water storage sizes larger than 15 litres. The domestic hot water draw off pattern(s) shall be those specified in PAS 67, as augmented for the larger tapping cycles in BS EN 13203-2:2015 appropriate for the intended application of the DHWPK.

To be acceptable for the purpose of the Microgeneration Certification Scheme the HPER shall be less than the corresponding values shown in Table 1.

The HPER for the DHWPK shall be calculated using the method below:

DHWPK HPER CALCULATION PROCEDURE

The DHWPK is tested at specified tapping cycles. The HPER calculation is illustrated by the following example.

Tapping cycle used for measuring the performance of DHWPK	TC_No	XXL	[-]
Measured energy content of DHW during testing	QT _{HWTc}	24.459	[kWh/24h]
Electricity generated	QE _{EXP_HWTc}	8.895	[kWh/24h]
Electricity consumed	QE _{IMP_HWTc}	0.101	[kWh/24h]
Fuel energy consumption	QF _{HWTc}	39.662	[kWh/24h]
CO ₂ Emissions - Fuel = QF _{HWTc} x 0.216	CO ₂ _Fuel	8.567	[kgCO ₂ /24h]
CO ₂ Emissions - Electricity generated = QE _{EXP_HWTc} x 0.519	CO ₂ _Eexport	4.617	[kgCO ₂ /24h]
CO ₂ Emissions - Electricity imported = QE _{IMP_HWTc} x 0.519	CO ₂ _Eimport	0.052	[kgCO ₂ /24h]
Net CO ₂ emissions = CO ₂ _Fuel + CO ₂ _Eimport - CO ₂ _Eexport	CO ₂ _Net	4.003	[kgCO ₂ /24h]
CO ₂ Emission rate (HPER _{DHW}) = CO ₂ _Net / QT _{HWTc}	HYPER _{DHW}	0.164	[kgCO ₂ /kWh]

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If HPER_DHW value is less than the corresponding DHW tapping cycle value in Table 1, then the Unit complies with the HPER requirements of this Standard.

Table 1: Maximum permitted CO₂ HPER (kgCO₂/kWh) for DHWPK						
S	M	L	XL	XXL	3XL	4XL
0.346	0.289	0.271	0.262	0.260	0.255	0.252

ANNEX 2: COMBIPKs

Where an Electricity-Led Micro-Cogeneration Package consists of both a prime mover (typically a fuel cell) and a supplementary heat source (typically but not necessarily a gas boiler) and is intended for the production of electricity, domestic space heating and domestic hot water then it shall be tested in accordance with this Annex 2 and the current version of PAS 67 with the proviso that the package definitions shall be extended to include hot water storagesizes larger than 15 litres. A further proviso is that testing of hot water and space heating must be made possible, either:

1. By separate testing of hot water and space heating followed by calculation of the combined performance as defined in PAS 67, performed by the test house; or
2. By direct combined testing, where an accepted procedure exists (refer to MCS 011 – Testing and acceptance criteria).

Note: Calculations may be either under MCS 015 within this Annex 2 or whenever described in PAS 67.

CARBON EMISSIONS VALUE METHOD

To establish the carbon emissions value (C) of an Electricity-Led Micro-Cogeneration Package designed to provide both domestic heating and hot water, sufficient test points are required to adequately describe the performance curve. Whilst additional test points may be selected by a manufacturer, the following test points must be selected as a minimum:

1. 100% thermal output test (required by PAS 67)
2. 30% thermal output test (required by PAS 67)
3. 10% thermal output test (required by PAS 67)
4. 0% thermal output test (standby test required by PAS 67)
5. Domestic hot water test (required by PAS 67)
6. 100% prime mover thermal output, 0% supplementary heat source output test

The 30 % and 10 % thermal output tests may be achieved by either constant output of the prime mover supplemented by cycling of supplementary heat source(s) included within the Package.

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The carbon emissions value curve is to be established using data from these test points and compared to the carbon emissions value curve for a SAP 2009/2012 annual efficiency of at least 86 %, rated condensing combination boiler, with a Comparative hot water efficiency of at least 65.5 % across the same range. The carbon emissions value of the Electricity-Led Micro-Cogeneration Package shall be at least 10% less than the values for the condensing boiler at all points greater than 10 % thermal output. Linear relationships should be assumed between test points.

The carbon emission value shall be calculated using the following formula:

$$C \text{ (total carbon emissions)} = (Q_{\text{fuel}} \times \text{carbon intensity of fuel used}) - ((E_{\text{out}} - E_{\text{in}}) \times \text{carbon intensity of displaced grid electricity}^*) + ((H1 - H2) \times \text{carbon intensity of displaced grid electricity}^*)$$

Where:

H1	Heat load required as per PAS 67 in kWh
H2	Heat content delivered in kWh
Eout	Electricity production during the test period
Ein	Electricity consumption during the test period
Qfuel	Total gas fuel consumption during the test period

[*carbon intensity of displaced grid electricity is taken from the latest version of SAP, currently Table 12 of SAP2012].

The SAP method, where a combiPK Micro-Cogeneration Package replaces the existing heating plant.

The measure of environmental performance is the Dwelling CO₂ Emission Rate (DER), expressed in units of kgCO₂/m²/year to two decimal places, as calculated by the current version of SAP. SAP assessments of the building in which the Micro-Cogeneration Package is to be installed shall be carried out by a qualified SAP assessor.

The SAP assessment shall be carried out for the particular Micro-Cogeneration Package (identified by manufacturer, brand, and model name) to be installed. This can be done only if the Micro-Cogeneration Package has previously been registered in the Product Characteristics Database. The DER produced by the SAP assessment shall be recorded.

A second SAP assessment for the same building shall be carried out in which a boiler is substituted for the Micro-Cogeneration Package, using the same fuel. The energy performance of the boiler

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shall meet the requirements of B.1.2 or B.1.3 as appropriate. The boiler, which may be a combi boiler, shall also be specified as providing hot water service. No other changes to the data for the SAP assessment are allowed. The DER produced by SAP shall be recorded.

If the DER for the SAP assessment with the Micro-Cogeneration Package is less than or equal to the DER for the SAP assessment with the boiler, the environmental performance of the Micro-Cogeneration Package may be regarded as acceptable for the purpose of the MCS Scheme.

The HPER method, where a combiPK Micro-Cogeneration Package replaces the existing heating plant.

The measure of environmental performance is the Heating Plant CO₂ Emission Rate (HPER) in units of kgCO₂/kWh. Calculation of the HPER requires:

- the design heat loss of the building in Watts
- the nominal rated heat output of the Micro-Cogeneration Package in Watts (and confirmed by PAS 67 tests)
- the plant size ratio (as calculated in B.3.3)
- the independently verified Micro-Cogeneration Package annual energy data provided by the manufacturer, obtained from test results in accordance with PAS 67 and the annual performance method.

Note - it is preferable to take the annual energy data from the Product Characteristics Database as this has been independently verified by the Boiler Database administrator.

The design heat loss of the building shall be estimated using one of the following procedures:

(i) The Whole House Boiler Sizing Method for houses and flats. Available in printable form at: <http://www.domestic-gas.co.uk/documents/CE54.pdf>. The design heat loss in Watts shall be taken as the sum of boxes E and F only (the additional figure for water heating in section 7 is ignored).

(ii) "The Domestic Heating Design Guide" published by CIBSE. The design heat loss is calculated on Worksheet 1 in Appendix F as the sum of the heat losses from each room, with final adjustments for exposed location, high ceilings, etc.

(iii) The HHIC Heat loss calculator & Radiator Selector published by the Heating and Hot water Industry Council. The design heat loss is calculated as the sum of the heat losses from each room.

The plant size ratio shall be calculated as the nominal rated heat output of the Micro-Cogeneration Package in Watts divided by the design heat loss in Watts.

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The HPER shall be determined for the particular Micro-Cogeneration Package and plant size ratio. This shall be done either by:

- (i) Calculation by the annual performance method using data from PAS 67 tests; or
- (ii) Finding the HPER from the relevant entry in the Boiler Efficiency Database for the nearest plant size ratio below, and nearest plant size ratio above, and linear interpolating for the plant size ratio that applies to the particular dwelling in which the Micro-Cogeneration Package is to be installed.

To be acceptable for the purposes of the Microgeneration Certification Scheme the HPER shall be $\leq 0.251\text{kgCO}_2/\text{kWh}$.

Note: A HPER of $0.251\text{ kgCO}_2/\text{kWh}$ is considered to be equivalent to a gas boiler of SAP annual efficiency of 86 (%) with a plant size ratio of 1.5 and has been derived from a combination of experimental and analytical work.

This figure has been calculated using CO_2 emission figures for gas and electricity taken from Table 12 of SAP 2012 and is subject to change in future versions of SAP.

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ANNEX 3 ADD-ON MICRO-COGENERATION UNITS

This Scheme provides ongoing independent, third party assessment and approval of Add-On or DHWPK Micro-Cogeneration Unit(s) intended for installation in buildings, where the heating system:

- a) Includes a Micro-Cogeneration Unit and associated controls,
- b) The Micro-Cogeneration Unit will be the lead appliance in the heating system and the MCS Licence Holder shall specify all controls, ancillaries and installation instructions necessary for this operation,
- c) The Micro-Cogeneration Unit has a thermal and electrical output of less than 45 kWt or 50 kW_e respectively,
- d) Is fuelled by any of the following – second and third family gas; gas from a bespoke source; hydrogen; mineral oil; other liquid fuels, principally bio-oils; other fuels including unconventional fuels and solid fuels,
- e) Will produce electricity and heat in response to a thermal or electrical demand such that all electricity and heat recovered shall be made use of,
- f) The installation of the Add-On Micro-Cogeneration Unit shall not inhibit future plant/heating system upgrading in accordance with the MCS product’s installation instructions.

ADD-ON UNITS

The test procedures for the Add-On Micro-Cogeneration Packages are supplemented by the following:

- a) Measurements of additional parameters will be required because these products are tested with separate reference heat source e.g. gas boiler. This is defined in the document titled “Micro-Cogeneration Add-On-Test Package: Test methodology based on PAS 67:2013”
- b) Additional processing of test results are required for input into APM calculator. This is defined in the “Micro-Cogeneration Add-On Calculator”.

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ADD-ON DHWPKS

An Electric-Led Add-On DHWPK shall be tested in accordance with Annex 3 of this Standard, and the current version of PAS 67 with the proviso that the package definitions shall be extended to include hot water storage sizes larger than 15 litres. The domestic hot water draw off pattern(s) shall be those specified in the current version of PAS 67.

Add-On DHWPK products are tested with referenced supplementary heat source (e.g. 30 kW boiler). However, these products will be installed in a range of buildings with different type & size of supplementary heat sources, therefore the DHW performance test results should be normalised for the installation building using the following:

- a) Micro-Cogeneration Add-On-Test Package: Test methodology based on PAS 67: 2013,
- b) Micro-Cogeneration Add-On Calculator.

To be acceptable for the purpose of the Microgeneration Certification Scheme the heating system environmental performance shall be better than before installation.

ADD-ON COMBIPKS

Where an Add-On Electricity-Led Micro-Cogeneration Unit or Package is used with a supplementary heat source (typically but not necessarily a gas boiler) and is intended for the production of electricity, space heating and domestic hot water, then it shall be tested in accordance with Annex 3 of this Standard and the Micro-Cogeneration Add-On-Test Package: Test methodology based on PAS 67: 2013, with the proviso that the Package definitions shall be extended to include hot water storage sizes larger than 15 litres. A further provision is that testing of hot water and space heating must be made possible, either:

- a) By separate testing of hot water and space heating followed by calculation of the combined performance as defined in the Micro-Cogeneration Add-On-Test Package: Test methodology based on PAS 67: 2013, performed by the Test House; or
- b) By direct combined testing, where an accepted procedure exists (refer to MCS 011 – Testing and acceptance criteria).

The Add-On-MCP products are tested with reference supplementary heat source (e.g. 30 kW boiler). However, these products will be installed in range of buildings with different type & size of supplementary heat sources. Therefore, the space heating (and domestic hot water if relevant) performance test results should be normalised for the installation building using the following:

- a) Micro-Cogeneration Add-On-Test Package: Test methodology based on PAS 67: 2013;

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b) Micro-Cogeneration Add-On Calculator.

To be acceptable for the purpose of the Microgeneration Certification Scheme the heating system environmental performance shall be better than before installation.

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AMENDMENTS ISSUED SINCE PUBLICATION

Document Number	Amendment Details	Date
1.0	First Issue	16/11/2010
1.1	<p>Section 3: Boiler Efficiency database changed to Product Characteristics database.</p> <p>Updated references to read "or latest available version thereof"</p> <p>Section 4.5: Co-generated heat section added</p> <p>Section 4.7: Micro-Cogeneration Package definition added</p> <p>Addition of Annex 2 Combined Domestic Heating and Hot Water Appliances</p>	18/05/2012
1.2	Updated definitions	01/05/2015
2.0	<p>Updated to include Add-On Units or Packages and DHWPKs.</p> <p>Alignment to Appendix B "Environmental Performance" within MIS 3007-2.</p> <p>Inclusion of Annex 3 "Add-On Micro-Cogeneration Units".</p>	12/11/2018

2.1	MCS Mark Updated. Rebranding of document, update of email and website addresses and cosmetic changes.	01/12/2019
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