



The Certification Mark for Onsite
Sustainable Energy Technologies

Microgeneration Installation Standard: MIS 3004

REQUIREMENTS FOR MCS CONTRACTORS UNDERTAKING THE SUPPLY, DESIGN, INSTALLATION, SET TO WORK, COMMISSIONING AND HANDOVER OF SOLID BIOFUEL HEATING SYSTEMS

Issue 4.2

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Climate Change (DECC), 3 Whitehall Place, London, SW1A 2HH.

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This Standard has been approved by the Steering Group of the MCS.

This standard was prepared by the MCS Working Group 5 'Biomass Heating Systems'.

REVISION OF MICROGENERATION INSTALLATION STANDARDS

Microgeneration Installation Standards will be revised by issue of revised editions or amendments. Details will be posted on the website at www.microgenerationcertification.org

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 MIS 3004. At the time of publication, the editions indicated were valid. All documents are subject to revision, and parties applying this document MIS 3004 are encouraged to investigate the possibility of applying the most recent editions of the documents referenced.

The following document MIS 3004 Issue 4.2 is a minor update to MIS 3004 Issue 4.1. It is available for reference from the date of publication (06/05/2015). MCS Contractors of microgeneration systems who are certificated in accordance with MIS 3004 may commence working in accordance with this update from the date of publication (06/05/2015). MCS Contractors of microgeneration systems who are certificated in accordance with MIS 3004 shall commence working in accordance with this update from the implementation date (06/08/2015).

This Standard identifies the evaluation and assessment practices to be undertaken by the Certification Bodies for MCS for the purposes of approval and listing of MCS Contractors undertaking the supply, design, installation, set to work, commissioning and handover of Solid Biofuel Heating Systems. The listing and approval is based on evidence acceptable to the Certification Body:

- that the system or service meets the Standard;
- that the MCS Contractor has staff, processes and systems in place to ensure that the system or service delivered meets the Standard;

And on;

- periodic audits of the MCS Contractor including testing as appropriate;
- compliance with the contract for the MCS listing and approval including agreement to rectify faults as appropriate.

This Standard shall be used in conjunction with the MCS 001 scheme document and any other guidance and / or supplementary material available on the MCS website specifically referring to this Microgeneration Certification Standard (MIS 3004). A

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catalogue of guidance and supplementary material to be read in conjunction with MIS 3004 can be found on the MCS website, www.microgenerationcertification.org.

Government defines 'Microgeneration' as the production of heat and/or electricity on a small-scale from a low carbon source. These various technologies have the potential to help achieve the objectives of tackling climate change, ensuring reliable energy and tackling fuel poverty.

The objective of Government's Microgeneration Strategy is to create conditions under which Microgeneration becomes a realistic alternative or supplementary energy generation source for the householder, for the community, and for small businesses.

NOTES:

This Microgeneration Installation Standard makes use of the terms 'must', 'shall' and 'should' when prescribing certain requirements and procedures. In the context of this document:

- *the term 'must' identifies a requirement by law at the time of publication;*
- *the term 'shall' prescribes a requirement or procedure that is intended to be complied with in full and without deviation;*
- *the term 'should' prescribes a requirement or procedure that is intended to be complied with unless reasonable justification can be given.*

Compliance with this Microgeneration Installation Standard does not of itself confer immunity from legal obligations.

Users of Microgeneration Installation Standards should ensure that they possess the latest issue and all amendments.

The Steering Group welcomes comments of a technical or editorial nature and these should be addressed to "the Secretary" at mcs@gemserv.com.

Listed products and services may be viewed on our website: www.microgenerationcertification.org.

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1 SCOPE

1.1 The details of this Standard specify the requirements of MCS for the approval and listing of MCS Contractors undertaking the supply, design, installation, set to work, commissioning and handover of microgeneration solid biofuel heating systems, and their fuel supply systems and heating systems supplying permanent buildings.

1.2 The MCS Biomass Working Group are currently reviewing the requirements for the installation of dry biomass systems. Until this is completed and it is necessary to install a dry biomass system, the MCS Contractor shall contact MCS.

1.3 For wet systems, elements of the building's space heating and/or hot water circuits including design, installation and system performance calculations are included in this Standard.

1.4 Multiple MCS certified solid biofuel heating products may be used in a single installation, but the individual output for a single product shall not exceed 45 kWth as defined by the MCS Product Certification Scheme document MCS 008.

1.5 All products must meet the requirements of MCS 008. For a summary of product categories see MCS 008.

1.6 The Scope of this MCS Installation Standard is limited to installations with a design heat load requirement of up to 70 kWth as determined in accordance with Section 4.41 of this Standard.

2 DEFINITIONS

Commissioning	The advancement of an installation from the state of setting to work of an installation, the regulation of the system and the fine tuning of the static completion to full working order to the specified requirements.
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	Commissioning includes recording all relevant measurements, flow rates and / or test results, and includes the preparation and submission of a commissioning report or certificate as required by the relevant technology standard that shall confirm that the system is capable of delivering the performance quoted to the customer.
Contract	An undertaking for the design, supply, installation, set to work, commissioning and handover of systems covered by the relevant technology standard. All contracts must be written to be compliant with MCS requirements.
Design	The formulation of a written plan including a specific list of products and fixings to form a completed system for a defined microgeneration technology; including extensions and alterations to existing microgeneration systems.
Installation	The activities associated with placement and fixing of a microgeneration system.
MCS Contractor	An individual, body corporate or body incorporate, applying for or holding MCS certification for delivery of supply, design and / or design review, installation, set to work, commissioning services and handover for systems covered by the relevant technology standard.
Set to work	The activities necessary to make the installed equipment function as a completed system prior to commissioning.
Subcontract	A written contract between an MCS Contractor and another firm for the supply of products and services in connection with the fulfilment of a contract.
Handover	The point in a contract where commissioning and certification of the system have been satisfactorily completed to the contract specification so enabling the installation to be formally explained and handed over to the client. Including all relevant documentation required by the relevant technology standard.
Solid Biofuel	Solid biofuel as defined in the “BS EN 14961 Solid biofuels — Fuel specifications and classes. Terminology, definitions and descriptions” and excluded from the Waste Incineration Directive.

Solid Biofuel heating product	A product, including its fuel supply system, with a heat output up to 45 kW, designed to burn only solid renewable biofuels; certified as meeting the requirements of MCS 008.
Wet Solid Biofuel Heating System	Boilers complying with MCS 008 designed to operate in the condensing or non-condensing mode for the heating of domestic dwellings and domestic dwellings in commercial premises by the circulation of heated water in open or closed systems. The boiler may also be used to provide domestic hot water.

3 REQUIREMENTS FOR THE MCS CONTRACTOR

3.1 Capability

3.1.1 MCS Contractors shall have the capability to undertake the supply, design, installation, set to work, commissioning and handover of solid biofuel heating systems.

3.1.2 Where MCS Contractors do not engage in the design or supply of solid biofuel heating systems, but work solely as an MCS Contractor for a client who has already commissioned a system design; then the MCS Contractor shall be competent to review and verify that the design would meet the design requirements set out in this Standard and this should be recorded.

Note: MCS Contractors that can install dry systems are not necessarily competent to install wet systems, see Section 5 for “Competence of Staff”.

3.2 Quality Management System

3.2.1 MCS Contractors shall operate a Quality Management System (QMS) which meets the additional requirements set out in the Scheme document MCS 001.

3.3 Subcontracting

3.3.1 MCS Contractors shall ensure that any work within the scope of the Scheme not undertaken by employees of the MCS Contractor meets the subcontracting requirements set out in the Scheme document MCS 001.

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3.4 Consumer Code of Practice

3.4.1 The MCS Contractor shall be a member of and, when dealing with domestic consumers, comply with a Code of Practice (Consumer Code), which is relevant to the scope of their business in the Microgeneration sector; and which is approved by the Trading Standards Institute (or formally approved under the Office of Fair Trading (OFT) prior to April 1st 2013).

4 DESIGN AND INSTALLATION REQUIREMENTS

4.1 Statement of Purpose

4.1.1 The design (see section 2) of the heating system shall contain a statement confirming its purpose. This shall confirm as a minimum that it has been designed and installed to provide space heating and (optionally) domestic hot water for indoor use. The statement shall also advise if the installation provides heating for other purposes such as to a swimming pool or to any feature external to the building (e.g. an outdoor hot tub)

Note: If the installation is intended to be eligible for RHI payments, it must have been designed and installed to provide space heating to multiple rooms (as a 'wet' system) and (optionally) domestic hot water for indoor use. If the installation also provides heating to a swimming pool or to any feature external to the building (e.g. an outdoor hot tub) then the installation might still be eligible for RHI, but special conditions may apply.

4.2 Regulations

4.2.1 All applicable regulations and directives must be met in full. It should be noted that regulations that must be applied may be different in England, Scotland, Northern Ireland and Wales. MCS Contractors shall ensure they are working to the most recent documents and have a system to identify all applicable regulations and changes to them.

4.2.2 All work, and working practices, must be in compliance with all relevant Health and Safety regulations and risk assessments shall be conducted before any work on site is commenced.

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4.2.3 All MCS Contractors shall make their customers aware of all permissions and approvals required for the installation.

4.2.4 The MCS Contractor shall assess the building using a competent professional experienced in solid biofuel heating systems to ensure that the site is suitable for the installation and that the building will meet the requirements of the Building Regulations (in particular those relating to energy efficiency) and other regulations applicable to their work during and following installation.

4.2.5 Where required, planning permission shall be obtained before work is commenced.

4.2.6 Where work is undertaken that is notifiable under the Building Regulations it shall be made clear to the customer who shall be responsible for this notification.

4.2.7 The MCS Contractor shall ensure that this notification has been completed prior to handing over the installation. Self-certification, in lieu of building control approval, is only permitted where installation and commissioning is undertaken by a person deemed competent and registered with a Competent Persons Scheme (CPS) approved by the Department for Communities and Local Government (DCLG) for the scope of work being undertaken. Further details can be found at <http://www.competentperson.co.uk>.

4.3 Design and Installation

4.3.1 Solid biofuel heating systems and fuel storage systems shall be installed in accordance with the guidance given in Building Regulations and Approved Documents in England and/or their equivalent regulations for Northern Ireland, Scotland and Wales, and Health and Safety Executive (HSE) guidance.

4.3.2 Where the legal requirement is more stringent than the product guidance, the legal requirement shall take precedence.

4.3.3 Where the product manufacturer's requirements exceed the Building Regulations then these shall be adhered to. Where the product manufacturer's requirements give additional guidance to the building regulations then these should be followed.

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4.3.4 Where manufacturer's instructions conflict with the requirement of this Standard, the MCS Contractor shall conform to this Standard unless it can be proven that conformance to the manufacturer's instructions will facilitate a system that is more efficient than if the requirements of this Standard were met.

4.3.5 The competence of staff includes their ability to design and / or install (also see Section 5 for Subcontracting).

4.3.6 Many factors such as fuel storage design are site specific at the design stage.

Note: Wood stores installed in Scotland need to meet Scottish Building Regulations.

4.4 System Performance

4.4.1 All of the following information in clauses 4.4.1 a) to k) inclusive shall be communicated in writing to the client before the point at which the contract is awarded:

Note: for information on the relevant "box" numbers, see Appendix C.

- a) If the product is to be installed in a **Smoke Control Area**, that it is a "recorded exempt product";

*Note 1: if the product is to be installed in a **Smoke Control Area**, under Section 21 of the Clean Air Act 1993, it must be a recorded exempt appliance, showing that it meets the limits agreed by DEFRA for operation of solid fuel appliances in a Smoke Control Area. See <http://smokecontrol.defra.gov.uk/>*

Note 2: similar legislation (the Clean Air Order 1981) covers Northern Ireland

Note 3: the listing of a solid fuel appliance within the MCS does NOT confer exempt appliances status.

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- b) whether the installation has been designed for intermittent or continuous space heating. If intermittent heating, then a suitable uplift factor must be applied to the design heat loss used to size the heat generator and the emitters;

Note 1: intermittent heating means that the heating system has the ability to provide all of the space heating requirement on the design day within a period of no more than 16 hours, without use of supplementary heaters. Continuous heating means that the heating system has the ability to provide all the space heating requirement on the design day within a period of no more than 24 hours (but taking more than 16 hours), without use of supplementary heaters.

Note 2: the uplift factor means the ratio between building heat loss used for sizing and the building heat loss as calculated for the design day. For example, if an additional allowance of 20% has been included for intermittent heating then the uplift factor is 1.2, and if the building heat loss calculated for the design day was 10 kW the building heat loss used for sizing used for sizing is 12 kW. Normally the same uplift factor would be used for both the heat generator and emitters.

- c) Where the system is intended to be eligible for domestic RHI payments or where metering/monitoring equipment is to be fitted to an existing installation, the MCS Contractor shall:

- Make the client aware of any metering that is required in order for the system to comply with requirements in the MCS Domestic RHI Metering Guidance, and ensure this is detailed in the quotation before the contract is awarded; and
- Ensure the system conforms to the MCS Domestic RHI Metering Guidance in full.

- d) That a heat loss calculation has been carried out for every room that is to be heated, and state:

- Which heat loss calculator was used;
- The assumed external temperature, if it was required as input data;
- The assumed internal temperature(s), if they were required as input data;
- The design heat loss of the building (Φ_{HL}) in kW.

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Examples of suitable heat loss calculation methods are:

- The current version of SAP for new dwellings. This provides a heat loss coefficient for the whole building in units of W/K, and should be multiplied by a representative temperature difference (external temperature on the design day minus internal temperature);
 - *The Domestic Heating Design Guide* published by CIBSE. In the current edition, the design heat loss is calculated as the sum of the heat losses from each room, with final adjustments for exposed location, high ceilings, etc.;
 - *The HHIC Heatloss Calculator & Radiator Selector* published by EES Data Ltd. The design heat loss is calculated as the sum of the heat losses from each room. See: <http://www.ees-data.co.uk/the-heat-loss-calculator/>
Note: Enquiries can be emailed to calculator@ees-data.co.uk or Tel: 01924 200103;
 - A method that is compliant with BS EN 12831 (UK National Annex).
- e) The nominal heat output rating of the proposed appliance (Rn) in kilowatts, declared by the manufacturer. If the appliance is a stove with a back boiler, the nominal heat output rating of each heating function shall be provided;
- f) The annual heat demand of the building (Qa) in kilowatt hours (space heating and hot water if applicable). This shall be calculated using any suitable method (to produce values for boxes 101 and 201 in Appendix C). Examples of suitable methods are:
- The current version of SAP for new dwellings;
 - Energy Performance Certificate (EPC) for existing dwellings;
 - Historic energy usage, converted to heat demand, by multiplying by the assessed seasonal efficiency of the existing heating system.

Note 1: the annual space heating and water heating demands as calculated by SAP or RdSAP are shown on the Energy Performance Certificate (EPC) for the dwelling.

Note 2: for the calculation of RHI payments the annual energy demand figures for space heating and (optionally) water heating will be taken from the Energy

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Performance Certificate (EPC). The reference number and date of the EPC shall be recorded.

Note 3: the heat demand on the EPC is calculated on standard occupancy assumptions and will be used to limit RHI payments. However, a separate calculation is advisable for particular householder circumstances (e.g. longer heating hours, higher temperatures, more hot water) and should underpin the figures given to customers.

The MCS Contractor is responsible for providing the customer with a heating system that is fit for their needs, which is not necessarily the same as assumed by RdSAP when producing an EPC.

- g) The proportion of the annual heat load and, if applicable, the proportion of the annual water heating load, (to produce values for boxes 102 and 202 in Appendix C) to be supplied by the biofuel heating system.

Note: in the case of stoves with back boilers, it should be assumed that they will not be used to produce hot water during the summer.

- h) The specification of the intended fuel, confirming:
- Where the appliance instructions specify the fuel(s) to be used with the appliance, that the intended fuel is as specified in the manufacturer's appliance instructions

Or;

- Where the manufacturer's appliance instructions do not specify the fuel(s) to be used with the appliance, that the intended fuel is in compliance with BS EN 14961 Solid Biofuels Fuel Specification and Classes

And;

- That in the document pack prepared for the customer is the specification of the intended fuel, including:
 - The gross calorific value (H_M) in kWh/kg at the appropriate moisture content; and,
 - The bulk density (ρ_B) in kg/m³.

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- i) The seasonal efficiency of the heating system (η_s) (to produce the value for box 104 of the calculator) as a percentage as listed in either the Products Characteristics Database (as “SAP seasonal efficiency”) or the default value from Table 4a of the version of SAP currently in force.

Note: Products Characteristic Database can be found at www.ncm-pcdb.org.uk/sap/

And;

- The estimated mass of fuel required in a year (M_a) in kg/yr, (values for boxes 105 & 205 in Appendix C);
- The estimated volume of fuel required in a year (V_a) in m³/yr, (values for boxes 106 & 206 in Appendix C)

Calculated as:

$$M_a = Q_a \times F \times 100 / \eta_s \times 1 / H_M$$

$$V_a = M_a / \rho_B$$

- j) At the nominal output:

- The manufacturers specified efficiency (η_k) as a percentage;
- The estimated rate of fuel consumption (M_h) in kg/hr;
- The estimated volume of this quantity of fuel (V_h) in m³/hr

Calculated as:

$$M_h = R_n \times 100 / \eta_k \times 1 / H_M$$

$$V_h = M_h / \rho_B$$

Note 1: additional estimates of fuel usage may be provided using differing gross calorific values to allow for natural variability in the fuel.

Note 2: additional estimates of system performance may be provided using an alternative methodology, but any such estimates shall clearly describe and justify the approach taken and factors used, shall not be given greater prominence than the estimate obtained using the method described above and shall have an

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associated warning that it should be treated with caution if it the results are significantly different from the results given by the method described above.

k) The following disclaimer:

'The performance of Microgeneration Solid Biofuel Heating Systems is impossible to predict with certainty due to the variability of the climate and its subsequent effect on both heat supply and demand. This estimate is based upon the best available information but is given as guidance only and should not be considered as a guarantee.'

4.4.2 The MCS Contractor shall provide to the client and keep on file evidence of compliance with the requirements of the building's space heating system (and hot water system if applicable) regarding specification and performance to ensure the correct and efficient operation of the system as a whole. This shall cover the selection of a microgeneration solid biofuel heating system of appropriate output for the building, and the design of heat distribution and heat emission systems and controls compatible with efficient operation.

4.5 Commissioning

4.5.1 Biofuel heating systems shall be commissioned in accordance with manufacturer's guidance (this might be reviewed as and when new guidance / legal requirements appear). Also, as part of commissioning of a biomass boiler appliance and its system, due regard must be given to the performance of the heating and hot water systems, their operation and control in conjunction with the biomass heating boiler and its controls.

4.5.2 A commissioning check sheet shall verify and record the following variables, by the MCS Contractor or commissioning engineer, as a minimum:

- Address at which the heating system is installed;
- Model and description of the solid biofuel biomass boiler(s) including serial numbers;
- Compliance with building regulations (such as ADJ and ADG);

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- A notice plate fitted;
- Adequate ventilation for the appliance;
- A CO alarm fitted (for appliances in dwellings);
- Date on which the system was commissioned;
- Draught reading (including setting of draught stabiliser if used);
- Gas flue analyses including:
 - Carbon monoxide (CO)
 - Carbon dioxide (CO₂)
 - Flue gas temperature
 - Oxygen, (O₂) content
- Pressure relief valve fitted (for un-vented systems);
- Confirmation that controls and system performance of the whole heating and hot water systems has been adjusted to achieve the designed performance.

4.6 Equipment

4.6.1 Biofuel appliances used in installations shall be listed under the MCS.

Note: see www.microgenerationcertification.org to view product list.

4.6.2 Biofuel appliances and ancillary equipment shall be fit for purpose of the intended installation.

4.6.3 All microgeneration solid biofuel boilers that are installed within the European Union must be CE marked in compliance with the relevant European Directives.

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5 ROLES AND COMPETENCY REQUIREMENTS

5.1 All personnel employed by, or subcontracted to, the MCS Contractor must be able to demonstrate that they are competent in the disciplines and skills appropriate to the activities required for their role in accordance with this Standard.

5.2 Complete records of training (where appropriate) and competence skills of personnel must be maintained by the MCS Contractor, in particular:

- Design staff, carrying out full conceptual design, must be able to demonstrate a thorough knowledge of the technologies involved and the interaction of associated technologies.
- All personnel engaged in the installation are expected to have the appropriate technical knowledge and installation skills, capable of installing components and equipment within the designed system, in accordance with all appropriate codes of practice, manufacturer's specifications and regulations. As a minimum MCS Contractors should have proven current training / experience with relevant solid biofuel heating systems as shown in Appendix A.
- All personnel engaged in the final inspection, commissioning, maintenance and repair must have a comprehensive technical knowledge of the products, interfacing services and structures to complete the specified processes.

5.3 Please see Appendix A below which contains the required roles which will need to be fulfilled by the MCS Contractor for this MIS 3004 Standard.

5.4 The Competence Criteria to be demonstrated by the MCS Contractor can be found via the MCS website (www.microgenerationcertification.org). In addition to this, the MCS Contractor guidance on how to achieve compliance and the descriptions of the required roles which will need to be fulfilled can also be found on the MCS website (www.microgenerationcertification.org).

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6 HANDOVER REQUIREMENTS

6.1 General

6.1.1 At the point at which the solid biofuel heating system is handed over to the client, documentation detailed in sections 6.3 and 6.4 shall be provided. Handover requirements should include either a building notice or self-certification from Competent Persons Schemes. The MCS Contractor shall provide all user related documentation detailed in sections 6.3 and 6.4 at handover, and any other documentation within 30 days of the completion of the contract.

6.1.2 Clients also need to be instructed in the safe and efficient operation and maintenance of the system provided at handover. This is usually contained within the manufacturer information, but shorter summaries by the MCS Contractor might be more useful to end users.

6.2 Compliance Certificate

6.2.1 Complete the Compliance Certificate for the solid biofuel wet heating system, available on the MCS website at [this link](#), ensuring that the Certificate corresponds to the current version of this standard at the time of commissioning.

Note: Only one Compliance Certificate is required for each heating system, irrespective of how many solid biofuel biomass boilers are installed.

6.3 Documentation

6.3.1 MCS Contractors shall provide customers with a comprehensive document pack which, as a minimum, includes the following:

- The Compliance Certificate duly completed;
- English versions of manufacturers installation and user instructions for all installed key components, written details of the specified fuel along with fuel storage, and handling requirements (including seasoning time for green logs or wood chips);

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- If installed in a Smoke Controlled Area, confirmation that the solid biofuel biomass boiler(s) is a recorded exempt appliance (see 4.4.1 (a));
- The maintenance requirements and maintenance services available;
- list of key components installed as per customers quote;
- A Commissioning Check Sheet (see 4.5).

6.3.2 All MCS Installations shall be registered to the MCS Administrator through the MCS Installation Database (MID). A certificate shall be obtained from the MCS Installation Database for each installation showing that the installation has been registered with the Scheme, and shall be provided to the customer no later than 10 working days after the date of commissioning the system. On provision of the certificate, the customer shall be instructed to include it within the handover pack.

6.3.3 The generation of the certificate shall be undertaken in full compliance with the terms and conditions of use of the MCS Installation Database¹. The registration of the system on the MCS Installation Database shall only be undertaken after the system has been fully installed and commissioned.

6.3.4 A “per installation” fee is levied on MCS Contractors for each registration added to the Database. Details of any such fee will be advised from time-to-time through MCS Certification Bodies.

6.4 Calculations

6.4.1 The MCS Contractor shall provide the customer with a written record of the details of the calculations made (as per section 4.4) to ensure the building’s heating and hot water load will be met. In providing such documentation it shall be clearly stated by the MCS Contractor what percentage of the building’s design heat loss, and what percentage of the building’s domestic hot water is expected to be provided by the solid biofuel heating system.

¹ The terms and conditions of use can be found on the MCS Installation Database website.

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6.5 Records

6.5.1 Any relevant records must be kept in line with MCS 001.

7 REGIONAL OFFICES

7.1 Where the MCS Contractor wishes to design, install and commission under the Scheme in regional offices, then these offices shall meet the requirements of this Standard to be eligible for Certification.

8 PUBLICATIONS FOR REFERENCE & FURTHER READING

8.1 The below list is provided so that MCS Contractors know which documents have been used as a basis for the development of the requirements of this MIS standard and they are able to further research topics if they need to do so.

8.2 It is not a scheme requirement for MCS Contractors to own or have immediate access to the documents referenced unless this MIS standard does not adequately cover off the aspects required.

- Scheme documents (available from www.microgenerationcertification.org)
 - MCS 001 – MCS Contractor Certification Scheme Requirements
 - MCS 008 - Product Certification Scheme Requirements – Biomass
- The MCS Solid Biofuel Wet Heating System Calculator (available from www.microgenerationcertification.org)
- The Compliance Certificate for solid biofuel wet heating systems available from <http://www.microgenerationcertification.org>
- Domestic Heating Compliance Guide (available from The Stationery Office or from:
http://www.planningportal.gov.uk/uploads/br/domestic_building_compliance_guide_2010.pdf)
- BS EN 14961 Solid Biofuels — Fuel Specifications and Classes (available from: www.bsi-global.com/en/Standards-and-Publications)
- The Government's Standard Assessment Procedure for Energy Rating of Dwellings (available from: www.bre.co.uk)

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- Domestic Heating Design Guide - The Chartered Institution of Building Services Engineers (CIBSE) (available from: www.cibse.org)
- BS EN 12831 Heating systems in buildings. Method for calculation of the design heat load

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APPENDIX A – Roles and Competency Requirements

	3001	3002	3003	3004	3005	3007	3007-2	300x
Roles	ST	PV	Wind	Biomass	Heat Pumps	CHP (Heat)	CHP (Elec)	Innovative Technology
Nominee	✓	✓	✓	✓	✓	✓	✓	**
Nominated Technical Person(s)	✓	✓	✓	✓	✓	✓	✓	**
Health and Safety co-ordinator	✓	✓	✓	✓	✓	✓	✓	**
Designer(s) Full scope	✓	✓	✓	✓	✓	✓	✓	**
Designer(s) Limited scope	✓	✓	✓	✓	✓	✓	✓	**
Electrical competencies	*	✓	✓	*	*	✓	✓	**
Plumbing competencies	✓	✗	✗	✓	✓	✓	✓	**
Heating competencies	*	✗	✗	✓	✓	✓	✓	**
Refrigeration competencies	✗	✗	✗	✗	*	✗	✗	**
Specialist competencies	*	*	*	*	*	*	*	**

✓ Required for the technology

✗ Not required for the technology

* If applicable to the technology

** For further details please see the MCS Change Process and the Competence Criteria on the MCS website:

(www.microgenerationcertification.org).

A change of staff fulfilling this role would require notification to the Certification Body.

APPENDIX B – Good Practice Guides, and other supporting documents and information

- Biomass Heating – CIBSE Knowledge Series: KS10 (for peak heating demand 50kw to 5000kW); Chartered Institution of Building Services Engineers London, 2007
- Domestic Central Heating Installation Specification, Heating and Ventilation Contractors' Association (HVCA); 2004
- Domestic Heating Compliance Guide; Office of the Deputy Prime Minister; 2006.
- Domestic Heating Systems Ranked by Carbon Emissions; BRE; 2007
- Energy Efficiency Best Practice Guide in Housing - Domestic heating: solid fuel systems; Energy Saving Trust CE47 (EST; 2005)
- Heating CIBSE Guide B1, Chartered Institution of Building Services Engineers London, 2002
- The Whole House Boiler Sizing method; BRECSU Energy Efficiency Best Practice Programme; 2000
- Guide A : Environmental design; CIBSE; 2006

Useful websites:

www.biomassenergycentre.org.uk

www.hetas.co.uk

www.nef.org.uk/logpile

<http://smokecontrol.defra.gov.uk/>

www.microgenerationcertification.org

www.bre.co.uk

www.oft.gov.uk

www.planningportal.gov.uk

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APPENDIX C – Solid biofuel wet heating system design calculations

SOLID BIOFUEL WET HEATING SYSTEMS

Data from design calculations

Annual energy calculations for MIS 3004 section 4.4.1

SPACE HEATING

Annual heat demand				
Demand	kWh/yr	[101]	See footnote 1	4.4.1 f)
Proportion of heat to be supplied by BHS (biofuel heating system)	%	[102]	Obtain from design worksheet	4.4.1 g)
Heat supplied by BHS	kWh/yr	[103]	= [101] × [102]	
Seasonal efficiency of the heating system (η_s)	%	[104]	See footnote 2	4.4.1 i)
Annual fuel requirement (mass) of BHS	kg/yr	[105]	Obtain from design worksheet	4.4.1 i)
Annual fuel requirement (volume) of BHS	m ³ /yr	[106]	Obtain from design worksheet	4.4.1 i)
Remaining heat to be supplied by other heat sources	kWh/yr	[107]	= [101] - [103]	

Where other heat sources are used:

Fuel used		[108]	Electricity / gas / LPG / oil / solid fuel
Efficiency of other heat sources		[109]	Obtain from relevant source; eg SAP or boiler database
Consumed by other heat sources	kWh/yr	[110]	= [107] ÷ [109]

WATER HEATING

Annual heat demand				
Demand	kWh/yr	[201]	See footnote 1	4.4.1 f)
Proportion of heat to be supplied by BHS (biofuel heating system)	%	[202]	Obtain from design worksheet	4.4.1 g)
Heat supplied by BHS	kWh/yr	[203]	= [201] × [202]	
Seasonal efficiency of the heating system (η_s)	%	[204]	See footnote 2	4.4.1 i)
Annual fuel requirement (mass) of BHS	kg/yr	[205]	Obtain from design worksheet	4.4.1 i)
Annual fuel requirement (volume) of BHS	m ³ /yr	[206]	Obtain from design worksheet	4.4.1 i)
Remaining heat to be supplied by other heat sources	kWh/yr	[207]	= [201] - [203]	

Where other heat sources are used:				
Fuel used		[208]	Electricity / gas / LPG / oil / solid fuel	
Efficiency of other heat sources		[209]	Obtain from relevant source; eg SAP or boiler database	
Consumed by other heat sources	kWh/yr	[210]	= [207] ÷ [209]	

PROPORTIONS, ENERGY CONSUMPTION, AND PERFORMANCE

Proportion of space heating and water heating demand provided by BHS	%	[301]	= ([103] + [203]) ÷ ([101] + [201])	4.4.1 f)
Heat supplied by BHS	kWh/yr	[302]	= [103] + [203]	
Seasonal efficiency of the heating system (η_s)	%	[303]	= [104]	
Annual fuel requirement (mass) of BHS	kg/yr	[304]	= [105] + [205]	4.4.1 i)
Annual fuel requirement (volume) of BHS	m ³ /yr	[305]	= [106] + [206]	4.4.1 i)
Fuel consumed by other heat sources	kWh/yr	[306]	= [110] + [210]	

ESTIMATED RUNNING COSTS (OPTIONAL)

Cost per unit of biofuel for BHS	p/kWh	[401]	Obtain from fuel supplier, or SAP Table 12
Cost per unit of fuel for other heat sources	p/kWh	[402]	Obtain from consumer, or SAP Table 12
Cost of biofuel for BHS	£/yr	[403]	= [302] ÷ [303] × [401] ÷ 100
Cost of fuel for other heat sources	£/yr	[404]	= [306] × [402] ÷ 100

CALCULATIONS FOR DOMESTIC RHI (OPTIONAL)**Annual energy figures**

Annual space heating demand	kWh/yr	[501]	Obtain from EPC
Annual water heating demand	kWh/yr	[502]	Obtain from EPC
Is space heating supplied by the BHS?		[503]	0 = no, 1 = yes
Is water heating supplied by the BHS?		[504]	0 = no, 1 = yes
Maximum qualifying heat supplied by the BHS	kWh/yr	[505]	= [501] × [503] + [502] × [504]

FOOTNOTES:

1. This should be obtained in accordance with MIS 3004 4.4.1(f), which specifies that it should be taken from the EPC and adjusted for any non-standard customer requirements (eg, higher internal temperatures, longer heating hours, high demand for hot water).
2. This should be obtained in accordance with MIS 3004 4.4.1(i), which specifies that either SAP Table 4(a) or the SAP seasonal efficiency from the Product Characteristics Database should be used as the source. The Product Characteristics Database is online at www.ncm-pcdb.org.uk/sap

AMENDMENTS ISSUED SINCE PUBLICATION

Document Number:	Amendment Details:	Date:
1.1	<p>Gemserv details added as Licensee.</p> <p>Document reformatted to reflect brand update.</p> <p>References to BERR updated to DECC, MCS logo updated accordingly.</p> <p>Website and email addresses updated to reflect new name.</p>	01/12/2008
1.2	Quality review	10/01/2009
1.3	MCS Mark Updated	25/02/2009
1.4	<p>Additional contacting options were added to clause 3.3. As agreed in the MCS Steering on 27/10/2009.</p> <p>References to Clear Skies have been removed from clause 4.6 and a link to the MCS website added.</p>	28/01/2010
2.0	<p>Addition of text under Section 6 – Handover (see 6.2 Documentation) incorporating the</p>	26/08/2010

	<p>generation of MCS Certificates from the MID for each installation.</p> <p>Changes are as agreed at SG meeting of May 27th 2010.</p>	
2.1	<p>Updated Section 6 Handover Requirements.</p>	03/02/2012
2.1a	<p>Minor correction to Section 6 Handover Requirements.</p>	20/02/2012
3.0	<p>Addition of commissioning checklist</p> <p>Rewrite of section 5 competence requirements</p> <p>Information relating to RHI</p>	01/08/2012
4.0	<p>Inclusion of the elements of the building's space heating and/or hot water circuits including design, installation and system performance calculations, within the scope.</p> <p>Introduction of a Compliance Certificate, to be completed for each installation, which will:</p> <ul style="list-style-type: none"> • be used to confirm that all actions in MIS 3004 affecting energy performance have been carried out; • be used as reference for all 	16/12/2013

	installations intended to qualify for RHI payments; <ul style="list-style-type: none"> incorporate elements of the existing MIS 3004 commissioning check list 	
4.1	Update to definitions.	01/05/2015
4.2	Minor corrections to cross referencing	06/05/2015