The Certification Mark for Onsite Sustainable Energy Technologies

Microgeneration Installation Standard: MIS 3004

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

Issue 2.1a

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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

This standard identifies the evaluation and assessment practices undertaken by certification bodies of the MCS for the purposes of approval and listing of 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 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 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 document MCS 001.

Government defines Microgeneration as the production of heat and/or electricity on a small-scale from a low carbon source. The various technologies have the potential to help us achieve our 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:-

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

1. SCOPE

This standard specifies the requirements of the MCS for the approval and listing of Contractors undertaking the supply, design, installation, set to work, commissioning and handover of microgeneration solid biofuel heating systems supplying permanent buildings.

For wet systems, elements of the building's space heating and/or hot water circuits including design, installation and system performance calculations are not included in this Microgeneration Installation Standard. However, the Contractor must demonstrate that the biomass system is provided in full knowledge of the heat distribution system to minimise the risk of low return temperatures causing condensation of flue gases, where relevant.

For the purposes of this Microgeneration Installation Standard, solid biofuel heating systems are defined as: Biofuel appliances designed to burn only solid renewable Biofuels (see 2.1) as specified by the manufacture with an output up to 45 kW_{th} also including their fuel supply system. For a summary of the solid fuel appliance categories and minimum efficiencies see section 5 table 5.2, within the Domestic Heating Compliance Guide available from the Department for Communities and Local Government (DCLG, previously ODPM).

The Low Carbon Buildings Programme (LCBP) does not consider grants for solid biofuel log fired roomheaters. However solid biofuel log fired roomheaters are included within the scope of this scheme.

2. DEFINITIONS

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

2.1	Solid Biofuel	Solid biofuel as defined in the “DD CEN/TS 14588:2004 Solid Biofuels. Terminology, definitions and descriptions” and excluded from the Waste Incineration Directive. Biomass, defined as all material of biological origin excluding material embedded in geological formations and transformed to fossil fuel. As well as solid biofuels produced directly or indirectly from biomass.
2.2	Commissioning	The activities to ensure that the installed system operates within the boundaries and conditions of the design and the product manufacturers claims.
2.3	Contractor	An individual, body corporate or body incorporate, applying for or holding certification for the services detailed in Scope, Clause 1 above.
2.4	Contract	A written undertaking for the design, supply, installation, set to work and commissioning of Microgeneration systems and technologies

2.5	Design	The formulation of a written plan and drawings as well as 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.
2.6	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 handed over to the client.
2.7	Installation	The activities associated with placement and fixing of a Microgeneration system.
2.8	Set to work	The activities necessary to make the Microgeneration system function as a completed system.
2.9	Sub-contract	A written contract between a certificated contractor and another firm for supply of products and services in connection with the fulfilment of a contract.

3. REQUIREMENTS FOR THE CERTIFICATED CONTRACTOR

3.1 Capability

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

Where Contractors do not engage in the design, or supply of biofuel heating systems, but work solely as an installer for a client who has already commissioned a system design; then the Contractor must be competent to review and verify that the design in regards to safety and applicable regulations meets the design requirements set out in this Microgeneration Installer Standard and this should be recorded.

Note: Installers 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

Contractors shall operate a quality management system which meets the additional requirements set out in the scheme document MCS 001.

3.3 Sub contracting

In installations for private customers, any work within the scope of the scheme not undertaken by employees of the Contractor shall be managed through a formal subcontract agreement between the two parties in accordance with the policies and procedures employed by the certificated Contractor. These procedures shall ensure that the subcontractor undertakes the work in accordance with the requirements of this standard.

In other situations (for example new build, or for commercial customers), it is permissible for the physical installation, setting to work and commissioning to be undertaken by others (i.e. not sub-contracted to the Contractor) provided that:

3.3.1 A contract between the Contractor and the commercial client details obligations on the client to include that evidence of skills and training of those employed by the client to do elements of work not undertaken by the Contractor are to be made available to the Contractor to ensure that

the competence requirements of this standard are met and that access to the site for training and supervision in accordance with the following sections is agreed in advance.

3.3.2 The certificated Contractor provides additional product-specific training for those undertaking the work not undertaken by the certificated Contractor.

3.3.3 The certificated Contractor assesses a sample number of installations under the contract which is not less than the square root of the number of installations rounded up to the nearest whole number (e.g. a new build site of 50 installations then a minimum of 8 are assessed).

3.3.4 The certificated Contractor assumes responsibility at handover that the installation is in full compliance with the standard.

3.4 Consumer code of practice

The 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 Office of Fair Trading (OFT). In the absence of any approved codes the MCS will accept codes that have completed stage 1 of the OFT approval process (e.g. REAL Code).

4. DESIGN AND INSTALLATION REQUIREMENTS

4.1 Regulations

All applicable regulations and directives must be met in full. Some guidance on applicable regulations is given in the guidance document MCS 002. This guidance is not necessarily exhaustive and may change from time to time. Certificated contractors shall ensure they have a system to identify all applicable regulations and changes to them.
It should be noted that regulations that must be applied may be different in England and Wales, Scotland and Northern Ireland.
All work, and working practices, shall be in compliance with all relevant Health and Safety regulations.

4.2 Site Planning and Building Integration

All contractors shall make their customers aware of all permissions and approvals required for the installation. The contractor shall assess the building using a qualified professional experienced in 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 and other applicable regulations during and following installation. Where required, planning and/or building control approval shall be obtained before work is commenced. Self-certification in lieu of building control approval is only permitted where installation and commissioning is undertaken by a person registered with a competent persons scheme, approved by DCLG (see MCS 002).

4.3 Design and installation

Biofuel Heating Systems shall be installed in accordance with the guidance given in Building Regulations and Approved Documents and/or their equivalent regulations for Northern Ireland and Scotland (also see MCS002). Where the legal requirement is more stringent than the appliance guidance it will take precedence. Equally where the manufacturer requirements exceed or give additional guidance to the Building Regulations then these should be adhered to.

The competence of staff includes their ability to design and / or install (also see section 5 for sub-contracting).

All user instructions must comply with current Building Regulations and the Clean Air Act (also see MCS002). 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 shall be calculated or obtained and communicated in writing to the client at or before the point at which the contract is awarded:

a) The design heat loss of the building in (Φ_{HL}) in kilowatts. This shall be calculated using any suitable method. Examples of suitable methods are:

- The current version of SAP for new dwellings

- *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.
- *The HHIC Heatloss Calculator & Radiator Selector* published by the Heating & Hotwater Industry Council. The design heat loss is calculated as the sum of the heat losses from each room. See: http://www.centralheating.co.uk/index/fuseaction/site.articleDetail/con_id/5528

b) The nominal rating of the proposed appliance (Rn) in kilowatts.

c) The annual heat load of the building (Qa) in kilowatt hours (space heating and hot water if applicable). This shall be calculated using any suitable method. Examples of suitable methods are:
   - The current version of SAP for new dwellings
   - Historic energy use for existing buildings

d) The proportion of the annual heat load to be supplied by the Biofuel heating system (F).

e) The specification of the intended fuel (see note) along with its gross calorific value (HM) in kWh/kg at the appropriate moisture content and its bulk density (ρB) in kg/m3.

f) The estimated mass of fuel required in a year (Ma) in kg and the volume (Va) in m3. This shall be calculated as:

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

$$V_a = M_a / \rho_B$$

Where:

ηs = Heating system seasonal efficiency from SAP 2005 Table 4a (%)

g) The estimated hourly rate of fuel consumption (Mh) in kg at the appliance's rated power output. and the volume of this quantity of fuel (Vh) in m3. This shall be calculated as:

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

$$V_h = M_h / \rho_B$$

Where:

η_K = The manufacturers specified efficiency at rated output (%)

h) 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.'

Additional estimates may be provided using differing gross calorific values to allow for natural variability in the fuel.

Note: the intended fuel needs to be in compliance with manufacturer's instructions, the Clean Air Act and shall be specified to European Standard as described in DD CEN/TS 14588:2004 and also excluded from the Waste Incineration Directive (also see section 2.1 and MCS002).

Additional estimates 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 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.

4.4.2 The Contractor shall provide evidence of consultation and compliance with the requirements of the designers and installers of the building's heat distribution 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 systems and controls compatible with efficient operation.

4.5 Commissioning

Biofuel heating systems shall be commissioned in accordance with manufacturer's guidance. This might be reviewed as and when new guidance / legal requirements appear.

4.6 Equipment

Biofuel appliances used in installations shall be listed under the MCS.
Note: See www.microgenerationcertification.org to view product list.

Biofuel appliances and ancillary equipment shall be fit for purpose and shall conform to the appropriate standards.

All Microgeneration solid biofuel boilers that are installed within the European Union must be CE marked in compliance with the relevant European Directives. These are listed in MCS002.

5. COMPETENCE OF STAFF

All personnel employed by, or sub-contracted to, the 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.

Complete records of training and competence skills of personnel must be maintained by the certificated 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.

- All personnel engaged in the final inspection, commissioning, maintenance or repair, must have a comprehensive technical knowledge of the products, interfacing services and structures to complete the specified processes.

Examples of qualifications that may be suitable for satisfying the training requirements are listed in Appendix B “Qualification of Staff”.

Note: Due to the current development of the Sector Skills Agreement and the review in progress of the National Occupational Standards for this technology, the competences indicated here may change.

For personnel employed in the installation of Microgeneration Solid Biofuel Heating Systems assessments of training and competence will cover the following underpinning knowledge areas:

Competences applicable to all solid biofuel heating system technologies:

- Health and Safety knowledge and awareness including risk assessments
- Assessment of the suitability of a solid biofuel heating system for the building and the efficient operation of its auxiliary heating system (and hot water system if applicable)
- Energy conservation including the requirements of the Building Regulations Schedule 1 Part L for new and existing buildings
- Calculation of building heating and hot water requirements (including heat losses and the effects of insulation)
- After-sales service and warranty
- Fault diagnosis
- Power supplies
- Awareness of relevant British Standards as per MCS 008 - Product certification requirements
- Performance data to be supplied
- System testing (including pressure, electrical and performance testing)
- Commissioning

- Site assessment, including solid biofuel heating system selection and optimising capacity and, if appropriate, use of an auxiliary heating system
- Solid Biofuel Heating system equipment siting, mounting and installation including secure fixing and connection of all components
- Environmental considerations – e.g. minimising risk of contamination due to leakage of materials, noise and vibration pollution
- How solid biofuel heating systems work – principles and components
- Works required for combustion appliances and their relevance to the Building Regulations Part J
- Electrical connections and relevance of the Building Regulations Schedule 1 Part P
- Works required for Solid Biofuel Stores, in line with manufacturer guidelines and / or relevant Building Regulations
- Plumbing connections
- Understanding of noise, vibration and insulation requirements and IP rating.

6. HANDOVER REQUIREMENTS

6.1 At the point at which the biofuel heating system is handed over to the client, documentation detailed in section 6.2 should be provided. Handover requirements should include either a building notice or self certification from competent person's schemes. The Contractor shall provide all user related documentation detailed in section 6.2 at handover and any other documentation within 30 days of the completion of the contract. Clients also need to be instructed in the safe and efficient operation and maintenance of the system provided at hand over. This is usually contained within the manufacturer information but shorter summaries by the installer might be more useful to end users.

6.2 Documentation

Certificated contractors shall provide customers with a comprehensive document pack which, as a minimum, includes the following:

- English versions of Manufacturers installation and user instructions for all installed equipment and in accordance with UK legislative requirements.
- Written details of the specified fuel along with fuel storage and handling requirements (including seasoning time for green logs or wood chips)
- Chimney data plate to Building Regulations Approved Document Part J
- The maintenance requirements and maintenance services available
- A commissioning certificate signed and dated by the contractor to confirm that the biofuel heating system has met the requirements of this standard. The certificate shall contain at least the following:
  - client name and address
  - site address (if different)
  - contractors name, address etc
  - list of key components installed as per customers quote.
  - estimated annual fuel requirements (in kg or tonnes or m^3) in line with performance calculations in section 4.4.

All MCS Installations shall be registered to the MCS Licensee through the MCS Installation Database. 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.

The generation of the certificate shall be undertaken in full compliance with the terms and conditions of use of the MCS Installation Database[1] and the registration of the system on the MCS installation database shall only be undertaken after the system has been fully installed and commissioned.

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

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

Bodies.

6.3 Calculation/s

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 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.

6.4 Records

Any relevant records must be kept in line with MCS 001 Appendix A clause 14. At present any records relating to the installation and inspection must be kept by the Contractor for a minimum of two years, subsequent to their examination and approval. Any contract related records must be kept for at least five years.

7. REGIONAL OFFICES

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

8. PUBLICATIONS REFERRED TO

The following list implies the latest edition and amendments:

- Scheme Documents (available from www.microgenerationcertification.org
  - MCS 001 - Installer Certification Scheme Requirements.
  - MCS 002 - Information on Buildings Regulations and European Directives
  - MCS 008 - Product certification scheme requirements – Biomass

- Domestic Heating Compliance Guide (available from The Stationery Office or from: www.planningportal.gov.uk/uploads/br/BR_PDF_PTL_DOMHEAT.pdf)
- DD CEN/TS 14588:2004 Solid biofuels. Terminology, definitions and descriptions (available from: www.bsi-global.com/en/Standards-and-Publications/)

- SAP 2005 – The Government's Standard Assessment Procedure for Energy Rating of Dwellings (available from: www.bre.co.uk/sap2005)
- Domestic Heating Design Guide - The Chartered Institution of Building Services Engineers (CIBSE) (available from: www.cibse.org)

APPENDIX A – Definition of the REAL Assurance Scheme

The Renewable Energy Assurance Listed (REAL) Scheme has been set up by the Renewable Energy Association (REA). It aims to guarantee a high quality experience for consumers wishing to buy or lease small generation units for their home, for a community building or for a small business. REAL membership is a sign that the supplier has agreed to abide by the high standards as set out in our Consumer Code. The REAL logo is a symbol of professional excellence.

REAL members are dedicated to providing the clearest information, the highest quality customer service and the most appropriate systems before, during and after a contract is agreed.

As members of the REAL Assurance Scheme, firms agree to abide by the REAL Assurance Scheme Consumer Code. It covers all the factors that contribute to a high standard of consumer service, before, during and after a contract is agreed
These include:

- clear information on the systems planned and their performance
- acceptable sales and marketing techniques
- arrangements for installing and connecting the system
- the selection and quality of goods supplied
- details of the conditions of business that apply
- the standard of any installation and other on-site work
- guarantees, and any maintenance and after-sales services needed
- what action will be taken to deal with any problems, and
- arrangements for monitoring and continuously improving the Code.

For more details about the Consumer Code, countrywide listings of REAL members or downloading an application form please browse http://www.realassurance.org.uk

APPENDIX B – Qualifications of Staff

The following qualifications may be suitable to satisfy the training requirements detailed under Clause 5, also see MCS 002:

- Accreditation from a relevant training course – relevance of the course would require independent verification
- Membership of a relevant Competent Person Scheme – relevance of the Competent Person Scheme would require independent verification
- Manufacturer's product training – Should be product specific and would require independent verification
- Experience gained through a mentoring process – would require independent verification
- Demonstrable track record of successful installation – would require independent verification

APPENDIX C – 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.

Useful websites:

www.biomassenergycentre.org.uk
www.hetas.co.uk
www.nef.org.uk/logpile
www.uksmokecontrolareas.co.uk
www.microgenerationcertification.eu
www.bre.co.uk
www.oft.gov.uk
www.planningportal.gov.uk

AMENDMENTS ISSUED SINCE PUBLICATION

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

	generation of MCS Certificates from the MID for each installation. Changes are as agreed at SG meeting of May 27th 2010.	
2.1	Updated Section 6 Handover Requirements.	03/02/2012
2.1a	Minor correction to Section 6 Handover Requirements.	20/02/2012