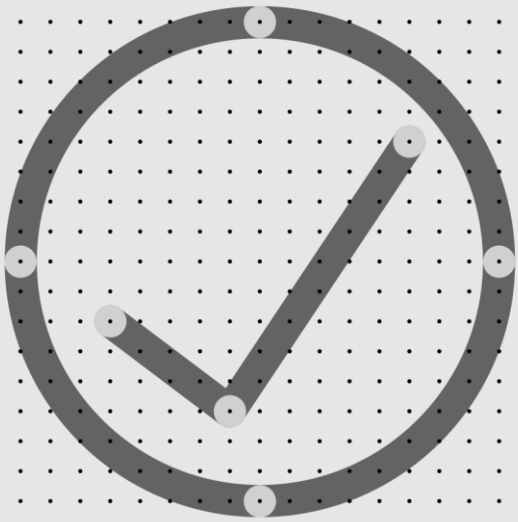
STANDARDS DOCUMENT

MCS 005 ISSUE 4.0 DRAFT

The Solar PV Standard

(Product)



This Microgeneration Product Standard is the property of the MCS Charitable Foundation, Innovation Centre, Sci-Tech Daresbury, Keckwick Lane, Cheshire WA4 4FS. Registered Charity No. 1165752

COPYRIGHT © The MCS Charitable Foundation 2022

This Standard was prepared by the MCS Working Group 2 'Solar Photovoltaic Systems'.

It is published by The MCS Service Company Ltd on behalf of the MCS Charitable Foundation.

Whilst all reasonable care has been taken in the preparation of this document it is provided on an "as is" basis without any guarantee of completeness or accuracy. The MCS Service Company Ltd and The MCS Charitable Foundation (and any related parties) do not accept liability for any errors or omissions in the document nor for the use or application of the information, standards or requirements contained in the document by any third party.

The MCS Service Company Ltd welcomes comments of a technical or editorial nature and these should be sent to *meetings@mcscertified.com*

COPYRIGHT © The MCS Charitable Foundation 2022

This Standard is freely available for personal use. Commercial use by those not holding a valid licence to use the MCS mark is prohibited. In the context of this document commercial use is defined as:

- A manufacturer claiming that any of its products are certified in accordance with this document
- An installation or maintenance contractor claiming that its design, installation or maintenance services are either certified in accordance with, or compliant with, this document
- An organisation offering certification or verification services in accordance with this document

Any unauthorised reproduction, use or transmission of all or part of this document without permission is strictly prohibited.

The MCS Service Company Ltd
Innovation Centre,
Sci-Tech Daresbury,
Keckwick Lane,
Cheshire WA4 4FS

www.mcscertified.com
hello@mcscertified.com
0333 103 8130

DRAFT

ABOUT MCS

Giving you confidence in home-grown energy

With energy costs constantly rising and climate change affecting us all, low-carbon technology has a bigger and bigger role to play in the future of UK energy.

We're here to ensure it's a positive one.

Working with industry we define, maintain and improve quality – certifying products and installers so people can have confidence in the low-carbon technology they invest in. From solar and wind, to heat pumps, biomass and battery storage, we want to inspire a new generation of home-grown energy, fit for the needs of every UK home and community.

About

The Microgeneration Certification Scheme Service Company Ltd (MCSSCo Ltd) trades as MCS and is wholly owned by the non-profit MCS Charitable Foundation. Since 2007, MCS has become the recognised Standard for UK products and their installation in the small-scale renewables sector.

We create and maintain standards that allow for the certification of products, installers and their installations. Associated with these standards is the certification scheme, run on behalf of MCS by Certification Bodies who hold UKAS accreditation to ISO 17065.

MCS certifies low-carbon products and installations used to produce electricity and heat from renewable sources. It is a mark of quality. Membership of MCS demonstrates adherence to these recognised industry standards; highlighting quality, competency and compliance.

Vision

To see MCS certified products and installations in every UK home and community.

Mission

To give people confidence in low-carbon energy technology by defining, maintaining and improving quality.

Values

1. We are expert – ensuring quality through robust technical knowledge
2. We are inspiring – helping to reshape energy in UK homes and communities
3. We are collaborative – working with industry and government to create positive change
4. We are principled – operating in a way that's clear, open and fair
5. We are determined – supporting the UK's drive towards a clean energy future

DRAFT

CHANGES TO STANDARDS

When MCS Standards are revised, the issue number is also revised to indicate the nature of the changes. This can either be a whole new issue or an amendment to the current issue. Details will be posted on the website at www.mcscertified.com

Technical or other significant 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 is given on the left of the decimal point, and the amendment number on the right. For example, issue 3.2 indicates that it is the third significant version of the document which has had two sets of minor amendments.

Note that only the latest issue of the standard will show amendment numbers in the table below. All legacy amendment numbers from previous issues are removed for simplicity.

Users of this Standard should ensure that they are using the latest issue.

Issue No.	Amendment Details	Date
1.0	First Publication	
2.0	Requirements for roof integrated collectors added. For immediate implementation. N.B. The changes do not affect products already certified.	23/06/2008
3.0	Changes made to clauses 2.1 and 5.1 to correct external reference. Amend the module variation within Clause 7.3.	10/10/2018
4.0	Update in response to MCS Standards Project review: • Modernised document style and updated to new MCS standard text. • Update to all external standards • Incorporating feedback from WG members	XX/XX/2022

COPYRIGHT © The MCS Charitable Foundation 2022

FOREWORD

This document contains references to other documents which may be either normative or informative. At the time of publication any editions of those documents, where indicated, were valid. However, as all documents are subject to revision, any users of this document should apply the most recent editions of those referenced documents (unless a dated version is specified).

This issue 4.0 is a significant update to issue 3.1. It is available for reference from the date of publication XX/XX/2022. Manufacturers or importers of microgeneration systems who have certificated products in accordance with MCS 005 may start working in accordance with this update from the date of publication. Compliance with this update is mandatory for products to be certified in accordance with MCS 005 from the date of implementation XX/XX/2022

.

DRAFT

TABLE OF CONTENTS

About MCS 3
Foreword 5
Table of contents 6
1 Introduction & Scope 7
2 Definitions 7
3 Applications to join the scheme 8
4 Management systems certification 8
5 Certification and approval 8
6 technical documentation 9
7 Performance and testing criteria 10
8 Maintenance of certification and listing 11
8.1 FACTORY AUDITS 11
8.2 PRODUCT AUDITS 11
9 Certification mark and labelling 12

DRAFT

COPYRIGHT © The MCS Charitable Foundation 2022

1 INTRODUCTION & SCOPE

This Standard describes the evaluation and assessment criteria for the purposes of certification and listing of solar PV products. The certification and listing of products is based on evidence acceptable to the Certification Body:

- that the product meets the appropriate standards detailed herein and;
- that the manufacturer has staff, processes, and systems in place to ensure that the product delivered meets the standard.

And on:

- periodic audits of the manufacturer, including testing as appropriate;
- compliance with the contract with the Certification Body for listing and approval including agreement to rectify faults as appropriate.

For roof-integrated PV modules (i.e. those that replace part of the roof covering and hence perform some of the functions of the roof covering), the product shall comply with this standard and the requirements within MCS 012.

2 DEFINITIONS

Solar PV product	A single environmentally protected assembly of interconnected solar PV cells.
Monocrystalline silicon	Often referred to as single-crystal silicon. Consists of silicon, where the entire solid's crystal lattice is continuous, unbroken to its edges, and free from grain limits.
Polycrystalline silicon	Consists of several fragments of silicon crystals melted together to form a single PV cell.
Thin film	Generic term for a range of different technologies alternative to crystalline silicon solar PV cells, typically formed by the deposition of a photovoltaic material onto a glass or other substrate.

DRAFT

COPYRIGHT © The MCS Charitable Foundation 2022

Irradiance Test Conditions	Standard Test Conditions (STC) *As defined in IEC TS 61836*	1000 W/m² – front side 0 W/m² – rear side
	Bifacial Name Plate Irradiance (BNPI) *As defined in IEC 61215-1:2021*	1000 W/m² – front side 135 W/m² – rear side
Module-Level Power Electronics (MLPE)	Module-level power electronics are devices that can be incorporated into a solar PV system to improve its performance in certain conditions (especially where shade is present) and to achieve several other solar design benefits. MLPE includes microinverters and DC power optimizers. They perform some of the same functions as a string inverter or central inverter but are typically coupled to just one (or a few) solar modules rather than many and offer additional features.	

3 APPLICATIONS TO JOIN THE SCHEME

Applications should be made to an accredited Certification Body operating this Scheme, who will provide the appropriate application form and details of the applicable fees.

4 MANAGEMENT SYSTEMS

Manufacturers shall operate a documented manufacturing quality control system compliant with the requirements of MCS 010 - factory production control requirements.

5 CERTIFICATION AND APPROVAL

Certification and approval is based on the following:

a) Evidence of compliance with one or more of the options listed in the scope and the performance and emission criteria detailed in Clause 7.

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).

b) Verification of the establishment and maintenance of the manufacturing company's quality management system in accordance with the Factory Production Control Requirements (FPC) (see MCS 010).

c) Review of the technical documentation relating to the material or product.

Additional products and alterations to certificated products may be accepted/certificated by a Certification Body without further testing, provided the differences between the additional product/altered product and fully qualified product would not require retesting according to *RETEST GUIDELINES TO BE REFERENCES HERE*

A certificate is awarded following demonstration of satisfactory compliance with the appropriate standard and this Scheme document, taking into account any limitations imposed by the Standard and other appropriate guidelines and satisfactory verification/assessment of the manufacturer's Factory Production Control and technical documentation.

Certificates contain the name and address of the manufacturer, model and reference number of the biomass product, 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 Item 8) but remain the property of the issuing Certification Body.

Details of the manufacturer and the certificated product(s) are listed at www.mcscertified.com

6 TECHNICAL DOCUMENTATION

Technical documentation for the product must be submitted for review. This documentation shall be presented in English, and shall be such that it can be assured that the products submitted for test are equivalent to those that are to be manufactured for normal production. The documentation must consist of the following as a minimum:

a) Details of intended use, application and classifications (if any) required;
b) Manufacturing drawings and/or specifications including tolerances, issue and revision numbers;
c) The revision number of the product;
d) Raw material and components specifications;
e) Details of the quality plan applied during manufacture to ensure ongoing compliance;
f) 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);*

g) User and installation documentation, including commissioning requirements, use and maintenance instructions with evidence that the installed system is able to meet the installation requirements of Building Regulations of the country where the product will be installed;
h) Intended fuel and its specification.

7 PERFORMANCE AND TESTING CRITERIA

This section sets out the performance requirements, testing methods and other specific requirements for each type of solar PV product recognised by the Scheme.

For all product types, physical testing is required at the conditions indicated either in this document or as defined in the relevant standards identified. All testing of products must be in accordance with the requirements of MCS 011.

7.1 COMPLIANCE WITH EXTERNAL STANDARDS

7.1.1 For compliance with this scheme, the solar PV product shall and continue to meet the requirements of the following external standards (as relevant):

- BS EN 61215-1:2021 & BS EN 61215-2:2021 – Test requirements
- BS EN 61215-1-1:2021 – Special requirements for testing of crystalline silicon photovoltaic (PV) modules
- BS EN 61215-1-2:2021 – Special requirements for testing of thin-film Cadmium Telluride (CdTe) based photovoltaic (PV) modules
- BS EN 61215-1-3:2021 – Special requirements for testing of thin-film amorphous silicon based photovoltaic (PV) modules
- BS EN 61215-1-4:2021 – Special requirements for testing of thin-film Cu (In,Ga) (S, Se) based photovoltaic (PV) modules

7.1.2 Modules with integrated module-level power electronics (i.e. those which utilise an integrated microinverter on the panel itself, allowing for both an AC and DC output directly from the panel), are eligible for MCS certification given that the DC PV panel itself passes the relevant part(s) of BS EN IEC 61215.

7.1.3 For Bifacial modules (i.e. those that can produce power from both their front side, as per a traditional module, but also from the back of the cells), the power output can be determined at BNPI test conditions.

7.2 TOLERANCE REQUIREMENTS

7.2.1 Module maximum power ($P_{mpp\ stc}$) tolerances as declared on the data sheet and label shall be either:

a) A value either side of zero (e.g. +/- 5%) or

b) A value relative to zero (e.g. 0% to +3%)

Note: for the manufacturer to adhere to Clauses 7.2.1a & b, they must ensure that the minima and maxima tolerances are not both on the same side of zero (i.e. +5% to +10% ***or*** *-5% to -10%). The minima must either be a minus or zero figure, while the maxima being a positive* ***or*** *the minima being a negative while the maxima being zero or a positive.*

7.2.2 A tolerance range of greater than 10% between the minima and maxima is not permitted (i.e. -5% - +10%).

8 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:

8.1 FACTORY AUDITS

Certification is maintained through on-going audits of the manufacturer's quality control system as appropriate, during which time a detailed check will be made that the product being manufactured is the same as the specification tested.

8.2 PRODUCT AUDITS

Product 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. Repeat testing of elements from the product standard as appropriate to confirm that the product continues to meet the requirements for certification and listing.

9 CERTIFICATION MARK AND LABELLING

All approved products 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.

The Certification Mark(s) to be used for newly certified products under the scheme is as follows:

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 certification is maintained.

DRAFT