



The Certification Mark for Onsite
Sustainable Energy Technologies

MCS 018

Product Certification Scheme Requirements: 'As New Hydro Product Standard'

This standard has been approved by the Steering Group of the Microgeneration Certification Scheme.

This standard was prepared by the Microgeneration Certification Scheme Working Group 4 'Hydro Working Group'.

REVISION OF MICROGENERATION INSTALLATION STANDARDS

MCS Installation Standards shall be revised by issue of revised editions or amendments. Details shall 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 shall 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 shall 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 shall ensure that they possess the latest issue and all amendments.

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1. INTRODUCTION

This document scopes out the requirements of 'As New Hydro Product' Scheme Document.

We are using the BS8887-2:2009 and BS8887-20:2010 to distinguish between a remanufactured product and a reconditioned or reused product to ensure that the product provided is equivalent to 'As New'. This requires an associated warranty that matches or exceeds that of a new product.

Our rationale for introducing this standard is that there are many existing hydro sites that are dormant, but could be brought back into use if the existing hydro runner and associated equipment and parts can be utilised and remanufactured.

Not only does this support the increased capacity of small scale hydro in the energy market, it also supports the concept of 'As New' products based on the BS8887-2 Definition of Remanufactured and BS8887-220¹, developed by Defra specifically with this type of situation in mind.

The definition of 'As New' and remanufactured and their position in the end-of-life hierarchy are all critical elements in ensuring 'As New' hydro schemes are of the appropriate quality (see figure 1).

This scheme document shall defer to the BS8887-2:2009 and BS8887-220:2010 in this respect.

¹ **Design for manufacture, assembly, disassembly and end-of-life processing (MADE) Part 2: Terms and definitions and Design for manufacture, assembly, disassembly and end-of-life processing (MADE) Part 220: The process of remanufacture – Specification**

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2. SCOPE

The MCS scheme provides ongoing independent, third party assessment and approval of companies who wish to demonstrate that their 'As New' Hydro products not exceeding 50kW have been remanufactured in accordance with BS8887-220:2010 and the requirements of this scheme document.

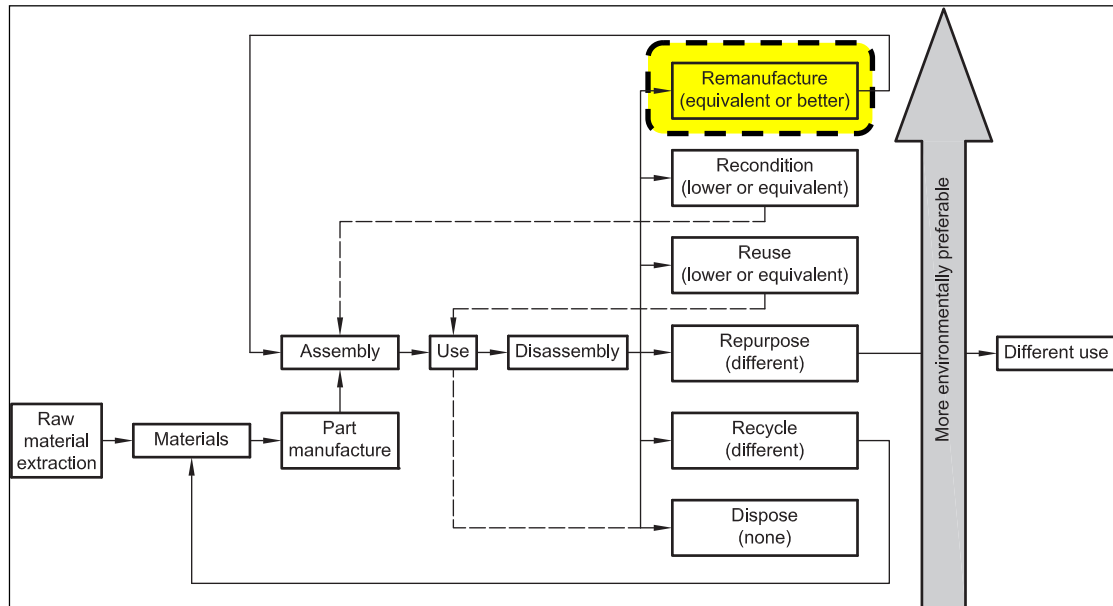


Figure 1 Illustration of where Remanufacture sits in the BS8887 - 220 hierarchy²

Note 1: Where an As New Hydro Product is being provided for installation in a scheme recognised for Clean Energy Cashback, the installer / site owner shall have to demonstrate that prior to the remanufacturing process the product met the requirements laid down in Section 5.8- 'As New Hydro Products' of the Hydro Installer standard.

Note 2: For the purposes of this standard the proposed As New Hydro Product shall have to demonstrate it has been non-operational since 1st October 1990.

² © British Standards Institution (BSI – www.bsigroup.com). Extract reproduced with permission. Source: BS 8887-220:2010: Design for manufacture, assembly, disassembly and end-of-life processing (MADE). The process of remanufacture. Specification.

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3. Definitions

The Definitions used in this standard:

‘As New’ - ‘product returned to a condition where it meets its original specification, from the user’s perspective’ source BS8887-2:2009, Published 2010

Note: Due to changes in site conditions or licensing conditions, the original performance may not be achieved.

‘As New Hydro Product’ – A hydro product with a scope equivalent to the Hydro Product Standard, however, has been remanufactured to the ‘As New’ definition and provides a warranty equivalent to a new or better than new product.

‘Core’ – product retained throughout the remanufacturing [As New Hydro Product] process. The Core shall be considered used and eligible for remanufacture when it has: been placed on the market; spent time in service; exceeded its shelf life; or been damaged after production but prior to sale e.g. during transit. *source BS8887-220:2010 4.2 Collection of core*

Note: This standard intentionally limits the scope of ‘Core’ in comparison to BS8887-220:2010

Origin (Original) - The origin of the ‘As New Hydro Product’ shall be from its last operative site, which shall be identified during the ‘collection of technical documents’ and ‘collection of core’ (see section 8).

‘Original Specification’ – The operational, safety and durability of the hydro product performance. Where the original performance is stated, this shall be the performance of the last operative site, from the user’s perspective.

‘Product’ – article manufactured for use, sale or lease. *source BS8887-220:2010*

The Product shall be required to be remanufactured to equivalent or better than a new product as defined in the standard. To meet this requirement the remanufacturing company shall have to demonstrate the product has been brought

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up to the standard of 'As New Hydro Product' status against the original design specifications, drawings and performance specification or can demonstrate that reverse engineering can provide the equivalent to 'As New'.

The evidence of this shall be through a review of the 'process of remanufacture and the steps required to change a used product into an as-new product, with at least the equivalent performance and warranty of a comparable new replacement product' - BS8887-220 Scope.

'Site' – As defined in Schedule A Standard Licence Condition 33, if the intention is to apply for Governmental incentives, such as Feed-In Tariffs.

'User' – This may be the owner or the owner's representative.

'Warranty & Issue of Warranty' – The remanufactured product shall be covered by a warranty that matches or exceeds that of a new product. See BS8887-2:2009

4. APPLICATIONS TO JOIN THE SCHEME

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

5. MANAGEMENT SYSTEMS CERTIFICATION

Manufacturers shall operate a satisfactory manufacturing quality control system and be capable of demonstrating competence in the process and steps of remanufacture of used Hydro [products] into As New Hydro [products].

Where sub-contractors are used, they shall be operating a satisfactory manufacturing quality control system and be capable of demonstrating competence in the process and steps for the sub-contracted elements of the works.

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6. CERTIFICATION AND APPROVAL

Certification Process

The MCS 'As New Hydro Product' Company shall be assessed and annually reviewed against the standard by an accredited MCS Certification Body for MCSxxx - As New Hydro Product.

This shall allow the certification process to be equitable to the other scheme requirements and also ensure that any product can be brought back to an 'As New Hydro Product' without each individual Hydro Product being certificated by the Certification Body.

Similar to FPC, the company shall have to demonstrate their competences to remanufacture and also demonstrate that they are following their in-house processes and procedures.

Each product remanufactured shall be identified by the location it has come from and against which [specification] it has been remanufactured against and recorded on a specification sheet.

The year of original manufacture, the last operative site and the remanufactured date shall also be recorded.

The certificate shall also record the last site the product was used and when it was last in commission.

The above information shall also be attached on a permanent data plate visibly accessible on site without having to use tools or aids to see it. The full remanufacturing data file shall be provided to the client and retained by the MCS Certificated Remanufacturing Company.

The remanufacturing data file shall be archived by the Certificated 'As New Hydro Product' company after [five] years and retained for a minimum of the life of the warranty.

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7. TECHNICAL DOCUMENTATION

Technical documentation for the product shall be submitted for review. This documentation shall be presented in English and shall be such that it can be assured that the remanufactured products submitted for test and or evaluation are equivalent or better than those of the original product. The documentation shall consist of the following as a minimum;

- Details of intended use, application and classifications (if any) required;
- Manufacturing drawings and/or specifications including tolerances, issue and revision numbers
- The revision number of the product
- Raw material and components specifications

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8. REMANUFACTURE CRITERIA

Each 'As New Hydro Product' shall have its original performance criteria established prior to the remanufacturing process to ensure it can be remanufactured to 'As New' or better and that a warranty can be provided against those claims.

The original performance criteria shall be determined either through documented evidence or through the reverse engineering process.

8.1 The remanufacturing process requirements

The remanufacturing process is characterised by the following processes and shall be carried out in accordance with BS8887-220:2010.

1. Collection of technical documents
 - a. The technical documents shall enable the effective disassembly, remediation and replacement of worn parts and the assembly of the product
 - b. Technical documents shall include tolerances, dimensions and material specifications. Documents shall also include information on expected and maximum safe operating conditions and the tests necessary to establish these tolerances can be met by the remanufactured product.
 - c. Technical documents shall be in the form of engineering drawings and be held either in paper or electronic format by the remanufacturer
 - d. Technical documents shall be derived either from the original documentation or from detailed analysis of the product through reverse engineering or some similar analysis
2. Collection of core³
 - a. Details of the last site the core was operational, including its last year the hydro scheme was operating.

Note: This evidence may be provided in many forms; however, it shall be factually verifiable.

³ Core – is defined in BS8887-220:2010 as 'component or product retained throughout the remanufacturing process. Example. In the case of a hydro turbine, this may be the runner.

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- b. Details on the location and operating conditions of the product shall be recorded
 - c. Evidence of the appropriate removal procedures for the unit shall be demonstrated
 - d. Evidence of referring to the appropriate technical documentation shall be demonstrated
 - e. Where necessary, demonstrate duty of care for the product.
3. Initial inspection
- a. Appropriate inspection criteria shall be defined and followed for inspecting the unit.
 - b. The inspection shall be performed by appropriately qualified staff
 - c. Defined pass/fail criteria shall be developed and used to ensure that an inappropriately sourced core shall not undergo remanufacture
 - d. The core shall be in a condition that enables initial inspection, for example the core shall be clean and removed from encasing structures not undergoing remanufacture.
 - e. Where possible tests on functionality shall be performed to determine if the product is fit for remanufacture.
4. Disassembly
- a. A set procedure for disassembly shall be established. This shall be to a degree that enables the remaining steps of the remanufacture to be performed.
 - b. Disassembly shall be to a degree that enables access to and assessment of the components of the product. This shall include, but not be limited to, wear parts such as bearings and valves and parts that are liable to corrosion or are perishable.
 - c. Appropriate tools shall be used to disassemble the product
 - d. Justification shall be given where destructive disassembly is necessary
5. Detailed inspection of components
- a. Each component shall be inspected using the appropriate inspection technique, which is detailed within the technical documents
 - b. Where feasible, components shall undergo defined working tests.
 - c. Components that do not conform with the specifications shall be identified and removed, either to undergo remediation or for replacement.
 - i. The identification of these components shall be documented

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- ii. The appropriate pathway shall be clearly documented to ensure that failing components receive an identified treatment.
- 6. Remediation of components
 - a. Components can undergo remediation to return them to their original specifications. The remanufacturer shall demonstrate appropriate knowledge, tools and procedures for performing this action. Where the work is subcontracted the remanufacturer shall demonstrate that they have the requisite skills and equipment.
 - b. After remediation the components shall undergo inspection and testing. This shall be documented.
 - c. The remediation process shall deliver a product which meets the specifications detailed in the technical documents. Evidence and justification shall be presented as to the choice of remediation employed.
- 7. Replacement (where components do meet the as new requirements)
 - a. Where components need to be replaced, the new components shall match the specifications detailed in the technical documents. Evidence shall be presented to confirm this. If subcontractors are used, the remanufacturer shall ensure that the produced replacement part meets the technical documents, with the appropriate warranty.
 - b. The replacement parts shall be tested to ensure that they meet the performance specifications necessary for the product.
- 8. Reassembly
 - a. Products shall be reassembled using technical documents as referenced.
 - b. Consumables shall meet as new technical specifications
 - c. An audit process shall be implemented to ensure that appropriate components are reused and that the provenance of the parts is known.
- 9. Testing
 - a. A robust testing procedure shall be documented. This procedure shall ensure that the product meets the specifications and tolerances.
 - b. Performance testing with the appropriate test equipment shall be undertaken to ensure that the remanufactured products performance is comparable to new, or better if that is part of the products claims.
- 10. Issue of warranty
 - a. An equivalent to as new warranty shall be issued with the remanufactured unit.

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- b. If the original warranty of the product is unknown, a warranty for an equivalent new product shall be used.
- c. The warranty shall match the equivalent new warranty, for example parts, labour and performance.

The MCS Certificated Company providing the 'As New Hydro Product' shall be required to demonstrate competencies in all of the above processes to meet the MCS Certification requirements.

The 'As New Hydro Product' certification shall not be restricted to any sub-set of a technology or manufacturers equipment.

Note: This standard has been established to provide confidence that the company is capable of remanufacturing any hydro product that comes through their establishment.

Inspection and testing functions and facilities necessary to ensure the 'As New Hydro Product' has met its warranted capabilities. Testing and Inspection facilities shall need to provide evidence of calibration where necessary.

8.2 Reverse Engineering

Where original technical documents are not available the hydro product can be reverse engineered. The Certificated Company shall be required to demonstrate their competencies to reverse engineer the hydro equipment.

9. Sub-contracting of engineering operations

Sub-contracting of elements of the remanufacturing process shall be carried out following a review / inspection of the capabilities and competences of those carrying out the works. The review shall be documented to demonstrate the core competencies of the company carrying out the work.

All sub-contracted works shall be carried out under a contract or purchase order providing details of the works to be carried out, including tolerances and special requirements.

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The responsibility for the works carried out by the sub-contractor shall remain with the 'As New Hydro Product' certificated company for the purposes of warranty.

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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:

9.1 Factory audits

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

9.2 Product audits

Product audits will be conducted as follows:

- 9.2.1 review of the product technical data files including materials
- 9.2.2 review of end of line tests in accordance with the manufacturer's quality plan
- 9.2.3 repeat testing of elements from the product standard as appropriate to confirm that the product continues to meet the requirements for certification and listing

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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 Certification Mark(s) in accordance with the Certification Bodies' instructions.

An example of the certification mark that can be used for this 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 in the right hand box.

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

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AMENDMENTS ISSUES SINCE PUBLICATION

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