Energy Technology List

Department for Energy Security & Net Zero

## Product application checklist

Please complete in BLOCK CAPITALS

# Organic Rankine Cycle Heat Recovery Equipment

Manufacturer/supplier name: .....

Applicant's name: .....

Telephone number: .....

**Product information**

Product name: .....

Model number: .....

Please complete each section of this form based on your product's characteristics. Incomplete or incorrect data could affect the processing of your product application.

Each product application should be made on a separate form unless a product's design characteristics are common to all the products. In this instance a single application can be made for multiple products.

| 1. | Product testing and certification | No | Yes |
|---|---|---|---|

**Where type testing has been applied to demonstrate product performance (i.e. for Method B below) ensure that the information supplied is sufficient to demonstrate the performance of all the products for which applications are being made.**

**1.1** **Does the product have an appropriate Conformity Assessment mark?** ☐ ☐

**1.2** **Which test method was used?**

Method A) Direct measurement ☐

Method B) Validated design calculations ☐

**1.3** **Has the product been tested in accordance with the test procedures and standard rating conditions in the following standards?**

BS EN 60953-2: 1996 ☐ ☐

Other, please specify:

.....

## 1. Product testing and certification (continued)

| | No | Yes |
|---|---|---|

**1.4** **How was the product(s) performance tested?** ***(Please select one)***

a) Tested in a laboratory either in house or on-site, witnessed by an independent accredited laboratory. (i.e. 'witnessed testing') ☐

b) Tested by an independent accredited laboratory (i.e. 'independent testing') ☐

c) Tested as part of on-site acceptance tests or field trials witnessed by an independent accredited laboratory ☐

d) Representative testing ☐

*Please note that the performance of products in categories 2 and 3 (only) may be determined from measurements made during field trials or acceptance tests, provided that the measurements have been made by, or witnessed by, an accredited laboratory. The product's net thermal efficiency must be calculated by an independent body that is competent to verify the measurement data.*

*Please refer to the ETL Testing Framework for details of the requirements that must be satisfied for each of these product testing options.*

**1.5** **Where product testing has been witnessed by an independent accredited laboratory, what was the name of the witness?** *(Please include contact details).*

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.....

**1.6** **Where product testing has been carried out by an independent accredited laboratory:**

a) What is the name of the independent accredited laboratory?

.....

b) What is the laboratory's registration number?

.....

**1.7** **Where product testing was done as part of on-site acceptance tests of field trials, please provide details of the independent body that calculated the net thermal efficiency.** *(Please include contact details).*

.....

.....

**1.8** **Where validated design calculations have been used which two models were used to calculate net efficiency (according to Method A in the criteria)**

| **Product model number** | **ETL Product ID number** *(where already listed on ETL)* |
|---|---|
| ..... | ..... |
| ..... | ..... |

*(The products must have a rated maximum electrical output of no more than 20% greater or smaller than one of the tested products)*

**1.9** **Where validated design calculations have been used which test methodology was used to obtain net efficiency of the two models?**

a) Witnessed testing ☐

b) Independent testing ☐

c) On-site acceptance tests or field trials ☐

**1.10** **Where the product's adjusted net efficiency has been calculated by an independent body that is different to the body or witness detailed in 1.5 & 1.6, what is the name of the independent body?** *(Please include contact details)*

.....

.....

.....

## 2. Product type (Please tick one)

| | | No | Yes |
|---|---|---|---|
| **2.1** | **What is the category of the product you are applying for?** *(tick one)* | | |
| | a) Remote, secondary-cooling type | | ☐ |
| | b) Integral cooling type | | ☐ |
| | c) Split-circuit type | | ☐ |

## 3. Product performance

| | | No | Yes |
|---|---|---|---|
| **3.1** | **Is the product:** | | |
| | a) A factory-built packaged unit? | ☐ | ☐ |
| | b) A split system (comprising a main assembly and a matched heat-rejection unit, designed for connection together on site)? | ☐ | ☐ |
| **3.2** | **Is the product:** | | |
| | a) Designed to generate electricity or produce mechanical power in the ORC shaft from waste heat? | ☐ | ☐ |
| | b) Rated for continuous operation with an electrical power output not exceeding 10MWe? | ☐ | ☐ |
| | c) Designed for permanent installation? | ☐ | ☐ |
| **3.3** | **Please confirm that the product does NOT:** | | |
| | a) Incorporate any form of combustion equipment, including boost burners | | ☐ |
| | b) Use water, ammonia or any water based solution as a working fluid | | ☐ |
| **3.4** | **What working fluid does the product use?** *(please give details)* | | |

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## 4. Product performance

| | | No | Yes |
|---|---|---|---|
| **4.1** | **What is the maximum temperature of waste heat the product is designed to capture:** | | |
| | a) ≤ 150°C? | ☐ | ☐ |
| | b) > 150°C and ≤ 250°C? | ☐ | ☐ |
| | c) > 250°C and ≤ 350°C? | ☐ | ☐ |
| | d) > 350°C? | ☐ | ☐ |
| **4.2** | **Does the performance of the product meet the relevant performance thresholds set out in Table 1 below?** | ☐ | ☐ |

*The ETL only covers products that fit into one of the specific categories listed in the table below, as defined by the product category and the maximum design waste heat temperature (°C).*

Table 1 **Adjusted net efficiency thresholds for waste heat to electricity conversion equipment**

| | Maximum design waste heat temperature (°C) | ≤ 150°C | > 150°C and ≤250°C | > 250°C and ≤ 350°C | > 350°C |
|---|---|---|---|---|---|
| | **Product Category** | **Minimum adjusted net efficiency, $\bar{\eta}$** | | | |
| 1. | Remote, secondary-cooling type | ≥ 10.0% | ≥ 12.5% | ≥ 20.0% | ≥ 22.0% |
| 2. | Integral cooling type | ≥ 7.0% | ≥ 8.9% | ≥ 17.0% | ≥ 20.0% |
| 3. | Split-circuit type | ≥ 7.0% | ≥ 8.9% | ≥ 17.0% | ≥ 20.0% |

'≤' means 'less than or equal to'
'≥' means 'greater than or equal to'
'>' means 'greater than'

Where: $$\text{Net Efficiency},\eta = \frac{\text{Electrical output (kW)-Electrical input (kW)}}{\text{Thermal input (kW)}}$$

And adjusted net efficiency, $\bar{\eta}$, is calculated from net efficiency, η, according to the calculation detailed in the ETL criteria for Organic Rankine Cycle Heat Recovery Equipment.

## 5. Summary of documents to be included

No | Yes

**Please send ONE copy of each of the following documents:**

**If the relevant information in support of the questions above is contained within a larger document, please indicate the location of the relevant information. Note that all documentation submitted must directly refer to the model numbers for which you are making this application.** Documentation should be added to your online application.

a) A technical sales brochure or leaflet for the product clearly summarising:

- i) The key features of the product (ideally including photographs of the product's exterior). ☐
- ii) The product's operation (i.e. in-built functionality) and intended applications (i.e. usage). ☐
- iii) Any product selection options (including optional extras, alternative configurations etc.). ☐

*This documentation should contain sufficient detail to enable the assessor to confirm that the proposed entry on the Energy Technology Product List (ETPL) is correct, and uniquely represents a single product of fixed design (as defined by the rules of the ETL). If the model names contain any 'wildcards' in respect of cosmetic variations please check with ETL Questions that this is permitted before submitting your application.*

b) A technical specification for the product, including:

- i) Details of the model numbers covered (including individual features of each model). ☐
- ii) The product's design ratings (electrical, mechanical, thermal, flow rates, energy use etc.). ☐
- iii) A description of how to install the product including connection/wiring diagrams. Where the product must be assembled, configured and/or commissioned on site before use, please include instructions. ☐

*This documentation should contain sufficient detail to enable the assessor to confirm that each product entry on the ETPL has the design features specified in the eligibility criteria for that category of product. Please indicate on the checklist where information on specific design feature information is located in the documentation.*

c) Evidence that the products the performance criteria, including:

- i) Test reports showing product performance at the standard rating/test conditions. ☐
- ii) Details of the test procedures/standards used to determine product performance. ☐
- iii) A declaration certifying the accuracy of the test reports and confirming that:
  - The test facilities complied with the minimum specifications outlined in the test standard, and the required test conditions where applied during testing. ☐
  - All measurement equipment used in testing was calibrated by an accredited laboratory, or its calibration is otherwise traceable back to national standards. ☐
  - Appropriate quality assurance procedures have been used to verify or cross-check the accuracy and repeatability of the test procedures and test results. ☐
- iv) Where the validated design calculations test method (i.e. Method B) has been used, please ensure that this documentation contains the additional information as stated in the ETL criteria, including:
  - Details of the methodology and calculations used to determine product performance ☐
  - Evidence to demonstrate the accuracy of these calculations by interpolation or extrapolation of measurements obtained from tests of at least two referenced tested units ☐
  - Details of both the product under application and the referenced tested units ☐
- v) Where the test reports have not been prepared by an independent body, evidence that the accuracy of product performance data has been independently verified or cross-checked by an independent body. ☐

*Please refer to the ETL Testing Framework for further guidance on the submission of test results, and minimum information requirements.*

d) A Declaration of Conformity with UK/EU Directives on product safety, including:

- i) An appropriate Conformity Assessment mark ☐

e) Evidence that a quality assurance system/procedures is/are in place to:

- i) Control the specification, design, manufacturing and testing of the products. ☐

f) Signed application checklist ☐

*Please note that all product documentation provided must be written in, or translated into, English.*

## 6. Declaration

I confirm that the information given above is correct to the best of my knowledge and that I have read and agree to the terms and conditions governing the management of the Energy Technology List.
A copy of the terms and conditions can be found **here**.

Signature: ..... Date: .....

### For more information:

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**ETL786 v9**