

# Accelerated Capital Allowances Eligibility Criteria

Category: Refrigeration & Cooling Systems

## ***Technology: Chillers and Fluid Coolers***

Chillers and Fluid Coolers are defined as equipment that is designed to cool liquids by means of a free-cooler or refrigeration system that is packaged within a single factory assembled unit. Such equipment can also have a reverse cycle function to heat liquids.

**Chillers and Fluid Coolers equipment is considered to include the following:**

### Packaged Chillers

Packaged chillers generate chilled fluids that can be used to provide space cooling or process cooling. Reverse cycle packaged chillers are also able to heat fluids. Some air-cooled packaged chillers also incorporate free-cooling mechanisms that can be used to reduce the amount of electricity needed by the product to provide cooling at lower ambient temperatures. Package chillers cover the following types:

1. Air-cooled packaged chillers, which include:
  - a. Air-Cooled chillers that provide cooling only
  - b. Air-cooled, reverse cycle, packaged chillers that provide both heating and cooling
2. Water-cooled packaged chillers, which include:
  - a. Water-cooled chillers that provide cooling only
  - b. Water-cooled, reverse cycle, packaged chillers that provide both heating and cooling.

### Forced-Air Fluid Coolers

Forced-Air Fluid Coolers are specifically designed to cool water or process liquid by means of a heat exchanger using ambient air. They can be used to reduce the load on refrigeration systems by transferring heat from the fluid by means of fan-induced air forced over a finned tube heat exchanger. They can be used (in suitable ambient conditions) as an alternative to or in parallel or series with Packaged Chillers as a free cooling system. Some forced-air fluid coolers can incorporate a total-loss water spray system to generate an adiabatic effect to increase cooling efficiency and performance.

### Mechanical-Draught Cooling Towers

Forced and induced Mechanical-Draught Cooling Towers are wet evaporative systems which transfer heat from water-cooled Packaged Chillers or a process by means of fan-induced air circulation over a wetter surface. They can be used (in suitable ambient conditions) as an alternative to or in parallel or series with Packaged Chillers as a free cooling system.

In order to be included on the ACA Specified List, the specific Chiller and Fluid Cooler equipment must meet *all* of the relevant requirements set out below.

**Note:** Supporting documentation that clearly demonstrates ACA compliance according to the conditions below will be required as part of the ACA checking process. Detailed information on the types of documents accepted can be found in the separate Supporting Documentation guidelines.

### General Eligibility Criteria

(Applicable to all ICT Heat Rejection equipment)

No.	Condition
1.	All equipment and/or components must be CE marked as required by the specific EU directive(s).
2.	Each system must include the following optimisation functions: <ul style="list-style-type: none"> <li>• Optimise operating parameters to match changes in load requirements</li> <li>• Where applicable, be capable of communicating with other control and cooling equipment for the purposes of free cooling</li> </ul>
3.	All forced-air heat exchangers (i.e. air-cooled condensers for packaged chillers and forced-air fluid coolers) must: <ul style="list-style-type: none"> <li>• have a fin spacing of no less than 2mm</li> <li>• have the facility for full coil cleaning from the air-outlet side</li> <li>• where a protective coating (e.g. vinyl) option is offered have the performance values corrected for the de-rating effect of the protective coating.</li> </ul>

### Chiller Package – specific eligibility criteria

(To be met in addition to the general eligibility criteria)

No.	Condition
4.	Meet the cooling performance criteria for the applicable Thermal Load Capacity, measured by the Energy Efficiency Ratio (EER) of the <u>unit</u> at 100% (full) load capacity, as indicated in Table 1. <b>and</b> the European Seasonal Energy Efficiency Ratio (ESEER), as indicated in Table 1.
5.	Air cooled EER values must be obtained according to the test procedure EN14511 and standard rating conditions EN14511-2 Table 10 “Standard rating conditions, Water”, or scientific equivalent, as follows: <ul style="list-style-type: none"> <li>• Outdoor Unit – Water entering 12°C, leaving 7°C</li> <li>• Outdoor Unit - Air entering 35°C Dry Bulb</li> </ul>

6.	Water cooled EER values must be obtained according to the test procedure EN14511 and standard rating conditions EN14511-2 Table 8, or scientific equivalent, as follows: <ul style="list-style-type: none"> <li>Outdoor Unit – Chilled Water Side – Water entering 12°C, leaving 7°C</li> <li>Outdoor Unit – Heat Rejection Side - Water entering 30°C, leaving 35 °C</li> </ul>
7.	ESEER values must be according to the test procedure EN14511, or scientific equivalent, and the rating conditions as indicated in Table 2, to follow.
8.	Where applicable, the heating COP values must be obtained according to the test procedure EN14511 and standard rating conditions - EN14511-2 Table 9, outdoor air, for air-cooled chillers and EN14511-2 Table 7, water, for water-cooled chillers.

### ***Forced-Air Fluid Coolers - specific Eligibility Criteria***

(To be met in addition to the general eligibility criteria)

No.	Condition
9.	Must incorporate: <ul style="list-style-type: none"> <li>a heat exchanger designed to cool water or other process liquids.</li> <li>a fan which forces air over the heat exchanger.</li> <li>a series of control valves (or 'by-pass mechanism') that re-direct the water or other process liquid around the pre-cooler in response to a control signal.</li> <li>a controller that operates the by-pass mechanism and controls the fan at times when the ambient air temperature is higher than the water/process liquid inlet temperature.</li> </ul>
10.	Must have a minimum energy efficiency rating (EER) that is greater than or equal to 2.90 across the range of operating conditions where it is designed to provide cooling.  (where EER = net cooling capacity (kW) / effective power input (kW))

### ***Mechanical Draught Cooling Towers - specific Eligibility Criteria***

(To be met in addition to the general eligibility criteria)

No.	Condition
11.	Must incorporate a mechanism that continually wets the surface of the fill pack and must include a water pump and a water storage tank.

**Table 1: Minimum cooling performance values**

Type	Thermal Load Capacity (kW)	EER	ESEER
------	----------------------------	-----	-------

Air-Cooled Chiller Package	100 to 1500	$\geq 2.7$	$\geq 4.25$
Water-Cooled Chiller Package	100 to 3500	$\geq 4.65$	$\geq 6.55$

**Notes:**

Energy Efficiency Ratio (EER) is calculated as follows:

$EER = \frac{\text{Net rejection capacity (kW)}}{\text{Effective power input (kW) in cooling mode}}$

European Seasonal Energy Efficiency Ratio (ESEER) is calculated as follows:

$ESEER = A * EER_{100\%} + B * EER_{75\%} + C * EER_{50\%} + D * EER_{25\%}$

With the following weighting coefficients:

$A = 0.03 ; B = 0.33 ; C = 0.41 ; D = 0.23$

**Table 2.: ESEER test conditions**

Part Load Ratio	Air temperature (°C)	Water temperature (°C)	Weighting coefficients
100	35	30	3 %
75	30	26	33 %
50	25	22	41 %
25	20	18	23 %

-----End of ACA eligibility criteria-----

Please see next section for guidance on:

- 1. Technical details required in product submission**
- 2. Supporting documentation required**

## Guidance on product details and supporting documentation

**NOTE: The following information is not part of the official criteria document published within the relevant Statutory Instrument. It has been added here for guidance purposes only in order to help you to provide (a) product details and (b) the required supporting documentation.**

*All information contained in this guidance document is subject to change without notice.*

### Technical information required in product submission

The following are the specific technical values required as part of the product submission for this technology:

#### Product type

As part of the product submission you must first select which type your product is. Only one type can be chosen per product.

#### Thermal capacity

The thermal capacity in kW of the heat rejection product is required as a value for the product submission. It must be entered as whole number only (do not include kW symbol). There should also be no spaces or full stops after the number submitted.

#### EER

The EER for the product is required as a value for the product submission. It must be entered as number only without units. There should also be no spaces or full stops after the number submitted. The figure must comply with the criteria requirements for minimum EER values.

### Supporting documentation required

Described below is the list of documents that are accepted as proof of compliance for the specific condition.

**Note: This information will only be requested AFTER you submit your product's basic details online**

#### **Important Notes to Product Providers**

**Please ensure that you read the "Important Notes to Product Providers" section at the end of this document prior to submitting documentation.**

**General Conditions**

(Applicable to all equipment)

<b>No.</b>	<b>Condition</b>	<b>Supporting Documentation Requirement</b>
1.	All equipment and/or components must be CE marked as required by the specific EU directive(s).	<p>Official and published manufacturer's technical data sheet or brochure that demonstrates CE marking compliance.</p> <p><b>OR</b></p> <p>A copy of an official signed declaration on headed paper which confirms CE marking compliance.</p> <p>Official declarations should explicitly state the product for which CE marking is being confirmed (i.e. do not provide a letter simply stating general compliance with the relevant ACA Condition).</p> <p>Where a document is used to demonstrate conformance for a number of products or range of products it should clearly specify each individual product covered by that document.</p>
2.	<p>Each system must include the following optimisation functions:</p> <ul style="list-style-type: none"> <li>• Optimise operating parameters to match changes in load requirements</li> <li>• Where applicable, be capable of communicating with other control and cooling equipment for the purposes of free cooling</li> </ul>	Official and published manufacturer's technical data sheet, or brochure, that demonstrates compliance with the requirements of the condition.
3.	<p>All forced-air heat exchangers (i.e. air-cooled condensers for packaged chillers and forced-air fluid coolers) must:</p> <ul style="list-style-type: none"> <li>• have a fin spacing of no less than 2mm</li> <li>• have the facility for full coil cleaning from the air-outlet side</li> </ul> <p>where a protective coating (e.g. vinyl) option is offered have the performance values corrected for the de-rating effect of the protective coating.</p>	Official and published manufacturer's technical data sheet, or brochure, that demonstrates compliance with the requirements of the condition.

**Chiller Package - specific Eligibility Criteria**

(To be met in addition to the general eligibility criteria)

<b>No.</b>	<b>Condition</b>	<b>Supporting Documentation Requirement</b>
4.	Meet the cooling performance criteria for the applicable Thermal Load Capacity, measured by the Energy Efficiency Ratio (EER) of the unit at 100% (full) load capacity, as indicated in Table 1, and the European Seasonal Energy Efficiency Ratio (ESEER), as indicated in Table 1.	Official and published manufacturer's technical data sheet, or brochure, that demonstrates compliance with the requirements of the condition.
5.	<p>Air cooled EER values must be obtained according to the test procedure EN14511 and standard rating conditions EN14511-2 Table 10 "Standard rating conditions, Water", or scientific equivalent, as follows:</p> <ul style="list-style-type: none"> <li>• Outdoor Unit – Water entering 12°C, leaving 7°C</li> <li>• Outdoor Unit - Air entering 35°C Dry Bulb</li> </ul>	<p>Accredited certification that the equipment EER values have been obtained by testing according to the named standard.</p> <p><b>OR</b></p> <p>Evidence of official testing by manufacturer or independent test lab carried out according to the principles outlined in the named standard. Test reports should be of the format described in the 'Important notes to Product Providers' section of this document.</p> <p>Accepted Standard: EN14511</p> <p>See note on 'Scientific Equivalence' in the Important notes to Product Providers section of this document.</p>
6.	<p>Water cooled EER values must be obtained according to the test procedure EN14511 and standard rating conditions EN14511-2 Table 8, or scientific equivalent, as follows:</p> <ul style="list-style-type: none"> <li>• Outdoor Unit – Chilled Water Side – Water entering 12°C, leaving 7°C</li> <li>• Outdoor Unit – Heat Rejection Side - Water entering 30°C, leaving 35°C</li> </ul>	<p>Accredited certification that the equipment EER values have been obtained by testing according to the named standard.</p> <p><b>OR</b></p> <p>Evidence of official testing by manufacturer or independent test lab carried out according to the principles outlined in the named standard. Test reports should be of the format described in the 'Important notes to Product Providers' section of this document.</p> <p>Accepted Standard: EN14511</p> <p>See note on 'Scientific Equivalence' in the Important notes to Product Providers section of this document.</p>

<b>No.</b>	<b>Condition</b>	<b>Supporting Documentation Requirement</b>
7.	Air and water cooled ESEER values must be according to the test procedure EN14511, or scientific equivalent, and the rating conditions as indicated in Table 2, to follow.	<p>Accredited certification that the equipment ESEER values have been obtained by testing according to the named standard</p> <p><b>OR</b></p> <p>Evidence of official testing by manufacturer or independent test lab carried out according to the principles outlined in the named standard. Test reports should be of the format described in the 'Important notes to Product Providers' section of this document.</p> <p>Accepted Standard: EN14511</p> <p>See note on 'Scientific Equivalence' in the Important notes to Product Providers section of this document.</p>
8.	Where applicable, the heating COP values must be obtained according to the test procedure EN14511 and standard rating conditions - EN14511-2 Table 9, outdoor air, for air-cooled chillers and EN14511-2 Table 7, water, for water-cooled chillers.	<p>Accredited certification that the equipment COP values have been obtained by testing according to the named standard.</p> <p><b>OR</b></p> <p>Evidence of official testing by manufacturer or independent test lab carried out according to the principles outlined in the named standard. Test reports should be of the format described in the 'Important notes to Product Providers' section of this document.</p> <p>Accepted Standard: EN14511</p> <p>See note on 'Scientific Equivalence' in the Important notes to Product Providers section of this document.</p>

**Forced Air Fluid Coolers - specific Eligibility Criteria**  
(To be met in addition to the general eligibility criteria)

No.	Condition	Supporting Documentation Requirement
9.	<p>Must incorporate:</p> <ul style="list-style-type: none"> <li>● a heat exchanger designed to cool water or other process liquids.</li> <li>● a fan which forces air over the heat exchanger.</li> <li>● a series of control valves (or 'by-pass mechanism') that re-direct the water or other process liquid around the pre-cooler in response to a control signal.</li> <li>● a controller that operates the by-pass mechanism and controls the fan at times when the ambient air temperature is higher than the water/process liquid inlet temperature.</li> </ul>	<p>Official and published manufacturer's technical data sheet, or brochure, that demonstrates compliance with the requirements of the condition.</p>
10.	<p>Must have a minimum energy efficiency rating (EER) that is greater than or equal to 2.90 across the range of operating conditions where it is designed to provide cooling.</p> <p>(where EER = net cooling capacity (kW) / effective power input (kW))</p>	<p>Evidence of official testing by manufacturer or independent test lab carried out to determine the EER according to a relevant standard and demonstrating that the EER complies with the requirements of the condition.</p> <p>Test reports should be of the format described in the 'Important notes to Product Providers' section of this document.</p>

***Mechanical Draught Cooling Towers - specific Eligibility Criteria***

(To be met in addition to the general eligibility criteria)

<b>No.</b>	<b>Condition</b>	<b>Supporting Documentation Requirement</b>
<b>11.</b>	Must incorporate a mechanism that continually wets the surface of the fill pack and must include a water pump and a water storage tank.	Official and published manufacturer's technical data sheet, or brochure, that demonstrates compliance with the requirements of the condition.

## Important Notes to Product Providers

### **General**

There should be a clear link between all supporting documentation supplied and the product being submitted. This will typically take the form of a product code or product name that can be cross referenced between the submitted product and relevant supporting documentation. If product codes / names have been changed since publication of the supporting documentation, then official evidence of this must be provided with the supporting documentation supplied.

Any deviation from these requirements will result in the supporting documentation not being considered adequate for the purposes of demonstrating compliance with the criteria conditions. This will in turn delay the submission and/or result in the product not being considered eligible.

Where the ACA criteria or help documentation reference compliance to appropriate rather than specific standards, the onus is on the product provider to ensure that supporting documentation supplied references recognised standards that apply to the submitted product, i.e. the product must be covered under the scope of a recognised standard.

If any product submitted is later found not to meet the performance or specification criteria, then this product will cease to be considered eligible for the ACA.

**Note:** When supplying the supporting documentation through the online process you must ensure that the correct page number(s) of the document is referenced when compliance with the relevant condition is being demonstrated. An explanatory note should also be given where more than one page number is referenced.

### **Test Report**

A test report must comprise of the following elements:

An outline of the complete test including introduction, details on test conditions, the specific model details of the product tested, the steps taken in the test, the results, graphical representations, and a conclusion. All documents should be on headed paper and the document should be officially signed off. **All documentation must be in English**, or include adequate translation.

### **Certification**

Where certificates are provided, all tests must be carried out by an organisation that is accredited by a national accreditation body recognised via the European Cooperation for Accreditation (preferred) or the International Accreditation Forum. **All documentation must be in English**, or include adequate translation.

### **Scientific Equivalence**

Some ACA criteria conditions allow for scientifically equivalent tests and/or standards to be used. In the event that a product has not been designed, manufactured or tested to the specific standard named, then documentation relating to an equivalent internationally recognised standard may be used (where the phrase 'Or scientific equivalent' is included in the ACA condition or help documentation). In such applications, the onus will be on the product submitter to demonstrate satisfactory equivalence of the standards. However, submissions which reference such supporting documentation may take longer to process, and if

the product provider does not provide satisfactory evidence of equivalence, then the product will not be considered eligible for the ACA. **All documentation must be in English**, or include adequate translation.

**Note:** Where specific standards are cited in a condition or in the ACA help documentation, then documentation demonstrating that the relevant products have been designed, manufactured or tested to these specific standards is preferred. Scientific equivalence is considered the exception rather than the norm.

### **Representative testing**

Where test information is required for a range of technically similar products (e.g. configurations of one base product) then in exceptional instances a form of representative testing may be utilised once agreed in advance with SEI. Such testing is where only representative products are tested from a technically similar group or range of products. Provided a clear correlation can be demonstrated between the tested product and technically similar non-tested product, and that such a correlation clearly demonstrates the compliance of the non-tested product, representative testing may form an acceptable basis for supporting documentation.

**Note:** Where representative testing is used for a group or range of products, if the tested or representative product is removed from the list of eligible products then all related products are also removed.