

Precision Cooling

Summary of proposed Triple E eligibility criteria changes.

To facilitate a refinement of the eligibility criteria for precision cooling it is proposed to make the following amendments:

- The specific conditions relating to the current definition of CRAH and CRAC are removed.
- Table 1 – Updated to include new Energy Efficiency Ratio (EER) requirements for cooling systems.

The proposed eligibility criteria document is contained on the following pages.

Please follow this [link](#) to view the currently published eligibility criteria.

Triple E Eligibility Criteria

Category: Information and Communications Technology (ICT)

Technology: Precision Cooling

Precision cooling is defined as equipment that is designed to efficiently and effectively remove heat from enterprise IT equipment. This includes the most efficient cooling units and ancillary items designed to provide direct cooling and aid heat removal from IT rooms and cabinets.

Precision Cooling equipment is considered to include the following:

Refrigerant based equipment

Close Coupled Cooling Modules and Coolant Distribution Units (CDU)

Cooling modules such as row and rack cooling modules are units designed to provide localised cooling and may be connected directly, or via a CDU, to an outside condenser supplying the refrigerant. A CDU is a circulation system that is designed to distribute coolant to cooling modules. Refrigerant based cooling modules are appraised as a system which can include CDU and outside condensers.. All units can include relevant containment equipment.

Liquid based equipment

Close Coupled Cooling Modules and Coolant Distribution Units (CDU)

Close Coupled Cooling Modules such as row and rack cooling modules are units designed to provide localised cooling and may be connected directly, or via a CDU, to a chilled water system. A CDU is a circulation system that is designed to distribute coolant to cooling modules. Water based cooling modules are appraised as a complete system which can include applicable CDU. All units can include relevant containment equipment.

Immersive liquid cooled and direct touch coolant units

These are units designed to provide localised liquid cooling and may be connected to a chilled water or other heat rejection system. The units do not rely on air circulation to transport localised heat away from the equipment being cooled. All units can include relevant containment equipment.

¹ Containment Equipment are proprietary systems designed to channel air flow within IT rooms and cabinets with the aim of preventing hot and cold air streams mixing.

Precision Cooling Eligibility Criteria Overview

In order to be included on the Triple E Register, precision cooling equipment must meet all the relevant requirements set out below.

Note: Supporting documentation that clearly demonstrates Triple E compliance according to the conditions below will be required as part of the Triple E 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 Precision Cooling equipment)

No.	Condition
1.	All equipment and/or components must be CE marked as required by the specific EU Directive(s).
2.	Relevant equipment must meet the cooling performance criteria, measured by the Energy Efficiency Ratio (EER of the unit at 100% (full load) capacity, as indicated in Table 1.
3.	Relevant equipment must have a Sensible Heat Ratio (SHR), obtained according to EN14511 and the test conditions stipulated therein and below, greater than or equal to 0.9
4.	Each system must include the following optimisation functions: <ul style="list-style-type: none"> • Optimise operating parameters to match changes in load requirements • Where applicable, be capable of communicating with other control and cooling equipment for the purposes of system optimisation.

Cooling Module and CDU specific Eligibility Criteria:

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

No.	Condition
5.	A means of maintaining the temperature of coolant loops above the dew point temperature in order to prevent condensation.
6.	Compressors (if applicable) must have Variable Speed Drive control.

7.	<p>For refrigerant based equipment, EER values must be obtained according to appropriate test procedures outlined in EN14511, or scientific equivalent, and for test conditions as follows:</p> <p>Cooling Module - Air entering 37°C Dry Bulb, 20°C Wet Bulb. Outdoor Unit - Air entering 35°C Dry Bulb, 24°C Wet Bulb.</p> <p><u>Or</u></p> <p>For liquid based equipment, EER values must be obtained according to appropriate test procedures outlined in EN14511, or scientific equivalent, and for test conditions as follows:</p> <p>Cooling Module- Air entering 37°C Dry Bulb, 20°C Wet Bulb. Cooling Module/CDU – Water entering 7°C, leaving 12°C.</p>
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Table 1.: Energy Efficiency Ratio (EER) requirements for cooling systems:

Type	EER
Cooling Module and CDU - Refrigerant based	≥3.0
Cooling Module and CDU - Water based	≥20

Where:

$\text{Energy efficiency ratio (EER)} = \frac{\text{Total cooling capacity (kW)}}{\text{Effective power input (kW) in cooling mode}}$

----- End of Triple E eligibility criteria -----

Please see next section for technical detail submission and supporting documentation guidance

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 provide assistance with the submission of product details and the provision of the required supporting documentation.

Note: All information contained within 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:

Precision cooling product type

You must first select which type of precision cooling unit your product is. Only one type can be chosen per product.

EER

The EER for the product 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.

SHR

For CRACs and CRAHs, the SHR for the product 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 SHR values.

Supporting documentation required

Described below is the list of documents that are accepted as proof of compliance for the specific ICT Precision Cooling Equipment 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 Eligibility Criteria

(Applicable to all Precision Cooling equipment)

No.	Condition	Supporting Documentation Requirement
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>OR</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 Triple E 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.	Relevant equipment must meet the cooling performance criteria, measured by the Energy Efficiency Ratio (EER of the unit at 100% (full load) capacity, as indicated in Table 1.	Official and published manufacturer's technical data sheet or brochure that shows the EER of the precision cooling unit at full load capacity conforms with the specified value in Table 1.
3.	Relevant equipment must have a Sensible Heat Ratio, obtained according to EN14511 and the test conditions stipulated therein and below, greater than or equal to 0.9.	<p>Official and published manufacturer's technical data sheet or brochure that shows the Sensible Heat Ratio (SHR) is greater than or equal to 0.9.</p> <p>An official memorandum on headed paper is required if SHR values are not explicitly stated on datasheets but latent heat and sensible heat values are. In this case, the memorandum should detail the calculation and use the equation:</p>

		<p style="text-align: center;">Sensible Heat Ratio = Sensible Heat / Latent Heat</p> <p>The memorandum should clearly reference the source of all figures used in the calculation and also supply the source material being referenced in the memorandum.</p> <p>NB: SEAI may request test reports to demonstrate where the data used to calculate the SHR has been derived.</p>
4.	<p>Each system must include the following optimisation functions:</p> <p>Optimise operating parameters to match changes in load requirements</p> <p>Where applicable, be capable of communicating with other control and cooling equipment for the purposes of system optimisation.</p>	<p>Official and published manufacturer’s technical data sheet or brochure that demonstrates compliance with the requirements of the condition.</p>

Cooling Module and CDU specific Eligibility Criteria (To be met in addition to the general eligibility criteria)

No.	Condition	Supporting Documentation Requirement
5.	A means of maintaining the temperature of coolant loops above the dew point temperature in order to prevent condensation	Official and published manufacturer’s technical data sheet or brochure that demonstrates compliance with the requirements of the condition.
6.	Compressors (if applicable) must have Variable Speed Drive control.	Official and published manufacturer’s technical data sheet or brochure that demonstrates compliance with the requirements of the condition.

<p>7.</p>	<p>For refrigerant based equipment, EER values must be obtained according to appropriate test procedures outlined in EN14511, or scientific equivalent, and for test conditions as follows:</p> <p>Cooling Module - Air entering 37oC Dry Bulb, 20oC Wet Bulb. Outdoor Unit - Air entering 35oC Dry Bulb, 24oC Wet Bulb.</p> <p><u>OR</u></p> <p>For water based equipment, EER values must be obtained according to appropriate test procedures outlined in EN14511, or scientific equivalent, and for test conditions as follows:</p> <p>Cooling Module- Air entering 37oC Dry Bulb, 20oC Wet Bulb. Cooling Module/CDU – Water entering 7oC, leaving 12oC.</p>	<p>1. For refrigerant based equipment: Accredited certification that the product complies with EN14511and for test conditions as follows:</p> <ul style="list-style-type: none"> • Cooling Module - Air entering 37oC Dry Bulb, 20oC Wet Bulb. • Outdoor Unit - Air entering 35oC Dry Bulb, 24oC Wet Bulb. <p><u>OR</u></p> <p>Evidence of official testing by manufacturer or independent test lab carried out according to the principles outlined in the standard and conditions above. Test reports should be of the format described in the ‘Important Notes to Product Providers’ section of this document.</p> <p>2. For water based equipment Accredited certification that the product complies with EN14511and for test conditions as follows: Cooling Module- Air entering 37oC Dry Bulb, 20oC Wet Bulb. Cooling Module/CDU – Water entering 7C, leaving 12 C.</p> <p><u>OR</u></p> <p>Evidence of official testing by manufacturer or independent test lab carried out according to the principles outlined in the standard and conditions above. Test reports should be of the format described in the ‘Important Notes to Product Providers’ section of this document.</p>
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		See note on 'Scientific Equivalence' in the Important notes to Product Providers section of this document.
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Component List

The component list contains details and part numbers of any ancillary equipment that may be supplied to a customer as an additional component to the overall submitted system. It must be formatted according to the Triple E component list template.

When components are detailed in a component list, reference must be made to official and published brochures or data sheets where these components are described.

These brochures/datasheets must then be supplied in addition to the component list.

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 Triple E criteria or help documentation references 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 Triple E.

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 demonstrating compliance with the relevant condition. An explanatory note should also be given where more than one page number is referenced.

Test Report

A test report must include 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
- √ 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 Triple E 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 Triple E 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 Triple E register.

All documentation must be in English or include adequate translation.

Note: Where specific standards are cited in a condition or in the Triple E 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.