Accelerated Capital Allowances Eligibility Criteria

Category: **Lighting**

Technology: **Lighting**

Energy Efficient lighting - lighting units, comprising fittings, lamps, and associated control gear, that meet specified efficiency criteria.

Lighting Unit definition

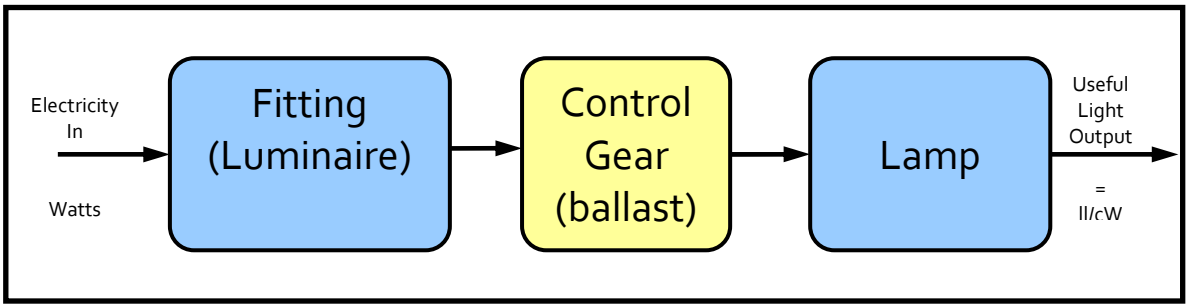

Fig. 1 – Three components of a lamp for the purpose of measuring efficiency.

Lighting Eligibility Criteria:
In order to be included on the ACA Specified List, energy efficient Lighting 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.*

A) Lighting units must include the three elements required for efficient light output: lamp, electronic control gear, and lamp fitting (see fig. 1). Lighting Units must comply with **condition 1 and 2**.

B) Lighting gear (electronic ballasts) sold independently of lighting units must comply with **condition 3**.

C) LED products must comply with **condition 4**.

General: All specified equipment must be CE marked as appropriate.

A) Lighting Units Criteria

Condition 1 - Photometric performance

The photometric data of the light fittings (Luminaires) must have been measured and tested in accordance with EN 13032-1&2 "Light and lighting – Measurement and presentation of photometric data of lamps and Luminaires"

–1: "Measurement and file format",

and

-2: "Presentation of data for indoor and outdoor workplaces"

, or scientific equivalent.

Condition 2 - Efficiency Criteria

The minimum efficiency criteria required for lighting units are outlined in Table 1. These criteria cover High pressure Sodium lamps, Metal Halide lamps, Linear Fluorescent lamps, triphosphor CFL lamps, and Induction lamps.

The calculation takes into account the efficiency of the lamps (Lumens per Watt), the power drawn by the control gear (measured in Watts), and the efficacy of the fitting in redirecting the light (Light Output Ratio, LOR)[1]. The output figure is Luminaire Lumens per circuit Watts (ll/cW).

Table 1 – Minimum efficiencies table for lighting units.

Luminaire Lumens per circuit Watts (ll/cW): **ll/cW = <u>total lamp lumens x LOR</u> circuit power drawn**	**Minimum ll/cW**
Units incorporating **high-pressure sodium** lamps	80
Units incorporating **metal halide** lamps	65
Units incorporating **linear fluorescent** lamps with associated electronic control gear integrated into fitting (luminaire)	50
Units incorporating triphosphor **compact fluorescent** lamps (CFL) with associated electronic control gear integrated into fitting (luminaire)	45
Units incorporating **Induction** lamps with external gear	45

[1] ULOR and DLOR values may be combined where the fitting is designed to provide direct *and* indirect lighting, otherwise only the LOR in the intended lighting direction may be used.

B) Lighting Gear (Ballasts)

Condition 3

Lighting Gear (ballasts) sold independent of Lighting Units must consist of the following:

a) Luminaire adaptors converting units with electromagnetic ballasts from T8 or T12 fluorescent tubes (by the use of electronic conversion units) to T5 fluorescent tubes.

and / or

b) Electronic high frequency (20,000 Hz+) ballasts for gas discharge lamps. Where lamps are included with the ballast it must be demonstrated that these are required in order to achieve efficiency improvements.

C) LED products criteria

Condition 4

LED units comprising LED chip, optics, heatsink, and associated control driver must achieve:

- L_{70} lifetime rating – i.e. maintain 70% of initial[2] lumens output after 35,000 hours of continuous operation

and

- A minimum of 40 Lumens per circuit Watt.

[2] Initial lumens measured after 100 hours operation.

---------- End of ACA 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:

Lighting type

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

Luminaire lumens per circuit watt (LL/CW)

For applicable lighting products (not luminaire adaptors, or high frequency ballasts) the LL/CW must be submitted to here. It must be entered as whole number only (do not include a units symbol). There should also be no spaces or full stops after the number submitted. The figure must comply with the criteria requirements for minimum values. Note that the LL/CW calculation does not include the LOR value only when calculating for LED Luminaires.

Rated lamp lifetime

For applicable lighting products (not luminaire adaptors, or high frequency ballasts) the rated lamp lifetime in hours must be submitted to here. It must be entered as number only (do not include units). There should also be no spaces or full stops after the number submitted.

Fitting Light Output Ratio (LOR)

For applicable lighting products (not LEDs, luminaire adaptors, or high frequency ballasts) the LOR must be submitted to here. Must be entered as a whole number only, e.g. 75% is entered as 75 and not as 0.75 or 75%. There should also be no spaces or full stops after the number submitted.

Total Luminaire Power Rating

For applicable lighting products (not luminaire adaptors, or high frequency ballasts) the luminaire rating in Watts must be submitted to here. This is rating for the complete lighting unit and includes the Ballast or Driver rating. It must be entered as number only (do not include units). There should also be no spaces or full stops after the number submitted.

Total Lamp Lumens output

For applicable lighting products (not luminaire adaptors, or high frequency ballasts) the total lamp lumens output must be submitted to here. This is the lumens output for all the lamps in the lighting unit. It must be entered as number only (do not include units). There should also be no spaces or full stops after the number submitted.

Supporting documentation required

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

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:

No.	Description
N/A	**Condition title:** *All specified equipment must be CE marked as appropriate.* **Supporting Documentation Requirement:** Official and published manufacturer's technical data sheet or brochure that demonstrates CE marking compliance. **OR** A copy of an official signed declaration on headed paper which confirms CE marking compliance. Official declarations should explicitly state the product for which CE marking is being confirmed (i.e. do not simply provide a letter simply stating general compliance with the relevant ACA Condition). 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. **Note:** supporting documentation for this condition must be included with the documentation for the relevant conditions below as there is no separate entry for this general condition.

Lighting Units Eligibility Criteria:

No.	Description
1.	**Condition title:** *The photometric data of the light fittings (Luminaires) must have been measured and tested in accordance with EN 13032-1&2 "Light and lighting – Measurement and presentation of photometric data of lamps and Luminaires"* *–1: "Measurement and file format",* *and* *-2: "Presentation of data for indoor and outdoor workplaces", or scientific equivalent.* **Supporting Documentation Requirements** Accredited certification that the equipment has been tested according to the named standard. **OR** 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. All evidence that is supplied MUST refer to the entire lighting unit (i.e. fitting, control gear and lamp). See note on 'Scientific Equivalence' in Important Notes to Product Providers section at end of this document.
2.	**Condition Title:** *The minimum efficiency criteria required for lighting units are outlined in Table 1. These criteria cover High pressure Sodium lamps, Metal Halide lamps, Linear Fluorescent lamps, triphosphor CFL lamps, and Induction lamps.* *The calculation takes into account the efficiency of the lamps (Lumens per Watt), the power drawn by the control gear (measured in Watts), and the efficacy of the fitting in redirecting the light (Light Output Ratio, LOR). The output figure is Luminaire Lumens per circuit Watts (ll/cW).* **Supporting Documentation Requirements:** Evidence that the lighting units meet the minimum efficiency requirements in Table 1 should be provided. A memorandum detailing the calculation and referring to figures that can be found in appended official and published datasheets could be supplied to demonstrate compliance with the condition. The calculation MUST refer to the entire lighting unit (i.e. Fitting, Control Gear and Lamp), and not individual components. The evidence supplied should detail the calculation, clearly showing the method by which the efficiency figure (as measured in Luminaire Lumens per circuit Watts) was achieved and detailing where the figures used during the calculation can be referenced.

Lighting Gear (Ballasts) Eligibility Criteria

No.	Description
3.	**Condition title:** *Lighting Gear (ballasts) sold independent of Lighting Units must consist of the following:* *a) Luminaire adaptors converting units with electromagnetic ballasts from T8 or T12 fluorescent tubes (by the use of electronic conversion units) to T5 fluorescent tubes.* *and / or* *b) Electronic high frequency (20,000 Hz+) ballasts for gas discharge lamps. Where lamps are included with the ballast it must be demonstrated that these are required in order to achieve efficiency improvements.* **Supporting Documentation Requirements:** • **For Luminaire adaptors** - Official and published manufacturer's technical data sheet or brochure that demonstrates the requirements of the condition. • **For Electronic ballasts** - Official and published manufacturer's technical data sheet or brochure that demonstrates the requirements of the condition.

No.	Description
4.	**There are two parts to Condition 4, and both parts of the condition must be met.** **Condition 4 Part 1** – *L_{70} Lifetime Rating.* *LED units comprising LED chip, optics, heatsink, and associated control driver must achieve:* *L_{70} lifetime rating – i.e. maintain 70% of initial[2] lumens output after 35,000 hours of continuous operation.* **Supporting Documentation Requirements:** LED units comprising LED chip, optics and associated control driver(s) must be rated to maintain 70% of rated lumens output at 35,000 hours, e.g. A lamp initially (after 100 hours) produces 550 lumens. After 35,000 hours of operation its output should not be less than 385 lumens (0.7 * 550 lumens). **Note:** It will be acceptable to demonstrate that the product maintains 96% of its initial (after 100 hours) lumens after 4000 hours of continuous operation. To demonstrate compliance with this requirement evidence of lifetime testing of the complete luminaire at normal operating conditions (not less than 20 °C) over 35,000 hours must be provided. A complete luminaire is considered to include the LED chip, Driver, optics and the actual or comparable light fitting in which they are operated (where comparable fittings are used acceptance of data will be at SEI's discretion). • All photometric data recorded during the lifetime test must be based on the principles of EN 13032-1 "Light and lighting - Measurement and presentation of photometric data of lamps and luminaires - Measurement and file format", or scientifically similar standard or method (e.g. IES LM 79-08). • Final lifetime test reports should be of the format described in the 'Important Notes to Product Providers' section of this document. **Note:** Complete LED luminaires undergo absolute photometric performance testing which does not include measurement of LOR. **Condition 4 Part 2** – *Lumens per circuit Watt rating.* *LED units comprising LED chip, optics, heatsink, and associated control driver must achieve:* *A minimum of 40 Lumens per circuit Watt.* **Supporting Documentation Requirements:** The luminaire lumens per circuit watt value is not merely the LED manufacturer's lumens per watt value, it is the final efficiency of the complete luminaire at normal operating conditions (not less than 20 °C). A complete luminaire is considered to include luminaire the LED chip, Driver, optics and the actual or comparable light fitting in which they are operated (where comparable fittings are used acceptance of data will be at SEI's discretion). • To demonstrate compliance with this requirement, independent or accredited manufacturers photometric testing of the complete luminaire at normal operating conditions must be provided. All photometric data recorded must be based on the principles of EN 13032-1 "Light and lighting - Measurement and presentation of photometric data of lamps and luminaires - Measurement and file format", or scientifically similar standard or method (e.g. IES LM 79-08). **Note:** Complete LED luminaires undergo absolute photometric performance testing which does not include measurement of LOR.

[2] Initial lumens measured after 100 hours operation

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.