



# Lighting Product Application Guide

Version 0.1 - Draft Release

21 November 2018



**An appropriate citation for this paper is:**

Essential Services Commission 2018, *Lighting Product Application Guide*,

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# Introduction

Products which are listed on our Register of Products is eligible to be installed, and able to create Victorian energy efficiency certificates (VEECs) once installed in eligible environments, under the Victorian Energy Upgrades program. This guide provides product applicants with guidance on how to apply for lighting products to be registered on our Register of Products.

## About this guide

This guide provides product applicants (whether they be accredited persons (APs), product manufacturers or other stakeholders) with instructions and our documentation requirements for applying for a lighting product to be registered on our Register of Products.

The product categories which are covered by this guide are:-

- Product category 21: Incandescent lighting products
- Product category 27: Public lighting upgrade products
- Product category 34: Building based lighting upgrade products
- Product category 35: Non-building based lighting activity products

This guide is divided into two sections:

- Section 1 provides general information and instructions on submitting lighting product applications
- Section 2 provides further detail of the documentary evidence required for the various lighting product categories

This guide must be read in conjunction with our Application Guide for Product Applicants which provides product applicants with information on:

- our Register of Products
- our product application and assessment process, including things to bear in mind throughout the process
- some product application functionality

## Who should use this guide

You should use this guide if you are

- seeking to apply for lighting products to be listed on our Register of Products under the Victorian Energy Upgrades program.

- interested in understanding the product application requirements for lighting products under the VEU program

You will need to hold a VEU account in order to apply for listing of products under the program. A link to create a new VEU account can be found at [www.esc.vic.gov.au/veu-become-accredited](http://www.esc.vic.gov.au/veu-become-accredited)

## Register of Products

We are required by the VEET Regulations to maintain a register of energy saving products that, if listed in the register, products may be installed under a prescribed activity to enable the creation of Victorian energy efficiency certificates (VEECs).

To be listed on the register, a product must be capable of performing to the minimum criteria specified in the relevant activity of the VEET Regulations.

The Register of Products is published at [www.veu-registry.vic.gov.au/register-products](http://www.veu-registry.vic.gov.au/register-products). The register provides businesses accredited to participate in the Victorian Energy Upgrades (VEU) program with a list of products that may be installed for each relevant prescribed activity. The register includes functionality for users to refine their search based on product brand, model, performance specifications, application status and effective date. The register also allows users to export the register for external reference.

APs are not required to submit applications to install products that are already listed on the Register of Products.

APs should note that we must remove a product from the Register of Products if we are satisfied the product does not meet the product criteria listed in the VEET Regulations and/or the minimum energy efficiency requirements in the VEU specifications.

We may remove a product if Energy Safe Victoria gives us written notice that a product is unsafe. We may remove or modify a product listing in the register further to a request from stakeholders – see Section 3.2 of the Application Guide for Product Applicants.

Upon its removal from the register, installations involving that product will not be eligible for the creation of certificates.

All users of the Register of Products should familiarise yourselves with the terms and conditions of listing a product on the register and the VEU Registry disclaimer (see <http://www.veu-registry.vic.gov.au/>).

## Seeking assistance

We appreciate the time and effort that businesses put into their applications and product officers will endeavour to work with you during the assessment process. If you encounter difficulties preparing your application, the commission website should be your starting point. If your question remains unanswered, or if you encounter technical difficulties with the portal, contact VEU support on (03) 9032 1310 or [VEU@esc.vic.gov.au](mailto:VEU@esc.vic.gov.au)

If you have submitted a product application, please use the designated 'notes' field in the online product assessment tool to communicate directly with the product officer responsible for assessing your application.

## Legal context for this guide

We have prepared this guide as a general summary of relevant parts of:-

- Victorian Energy Efficiency Target Act 2007 (the Act)
- Victorian Energy Efficiency Target Regulations 2018 (the VEET Regulations)
- Victorian Energy Upgrades Specifications 2018 (the VEU specifications)
- Victorian Energy Efficiency Target Guidelines (the guidelines)

All above legislative documents are available at [www.esc.vic.gov.au/veu-legislation](http://www.esc.vic.gov.au/veu-legislation)

This guide should not be relied upon as substitute for legal advice and should be read in conjunction with the above source documents. In the event of inconsistency between this guide and the source documents, the content in the source documents apply.

# 1. Lighting product applications

## 1.1. Lighting upgrade product types

### Incandescent lighting (product category 21)

Incandescent lighting products are eligible for installation in residential or non-residential premises. There are 6 different lighting products under this lighting product category:-

- LED GLS lamp (product category 21A)
- LED lamp for replacement of reflector (product category 21B)
- 12V non-integrated LED lamp (product category 21C)
- Mains voltage downlight LED luminaire (product category 21D)
- LED GU10 lamp with integrated driver (product category 21E)
- Mains voltage LED integrated downlight (product category 21F)

### Public lighting upgrade (product category 27)

Public lighting upgrade products are eligible for installation in public open spaces owned by relevant bodies. The spaces that are eligible are roads or public outdoor spaces. The replacement of traffic signals or lighting upgrades to sports fields is not eligible under the public lighting upgrade activity. There are two main product categories under this activity: 'AEMO approved' and 'ESC approved'. Applicants may submit products approved by AEMO to the ESC to be included in the AEMO category. Alternatively, they can show that a product meets our product requirements under Part 27 to be included in the 'ESC approved' category.

### Building based lighting upgrade (product category 34)

Building based lighting upgrade products are only able to be installed in non-residential/business based premises. Products requiring listing on the register include lamps and lighting control devices.

### Non-building based lighting upgrade (product category 35)

Non-building based lighting upgrade products are to be installed in environments not provided for under public lighting upgrade (activity 27) and building based lighting upgrade (activity 34). Eligible installation environments include outdoor spaces such as sports fields and parks.

## **1.2. General lighting application requirements**

The product approval requirements for each lighting product category differ from each other. You must review and familiarise yourself with the product performance and documentation requirements for each type of lighting product (listed in section 2 of this guide) before testing products and submitting product applications.

There are requirements to submit documents such as safety certifications, test reports, manufacturer's declarations, and confirmation of accreditation of test laboratory and product specifications. For example, a laboratory must be appropriately accredited by NATA or a similar accrediting body to perform ISTMT or LM80 tests. A safety certificate must be issued by a state government safety body or JAS-ANZ accredited approval provider.

There are circumstances where an applicant could submit one test report to represent several similar products. Unless explicitly stated in this guide, separate tests and accreditations are required for each individual product, and each test report must identify the brand and model of the product to which it applies. Only where specified, may a family of products be covered by a single test report. It is recommended that the testing laboratory refers to the information in this document before commencing testing products. It is recommended that the testing laboratory refers to the information in this document before commencing testing products.

All documentation submitted in support of an application must specify the product brand and model number. If different supporting documents contain different brands and/or model numbers, the applicant must submit a manufacturer's declaration clearly reconciling the different product brands and/or model numbers used across supporting documentation.

Note: Brand/model reconciliation documents are not accepted for safety certificates or ISTMT reports; these must be issued in the exact brand and model as the product applied for.

## **1.3. Lighting applications under project-based activities**

When installing lighting products as part of project-based activities, accredited persons (APs) must select from lighting products listed on our Register of Products. If the product is not listed on our Register of products, APs, or other applicants, may submit an application for approval under one of the lighting product categories (21, 27, 34 or 35). Please contact VEU support if the lighting product or installation environment for your project-based activity project does not fit within the requirements of these lighting product categories.

## **1.4. When can I submit a representative test report for ISTMT tests**

We will accept a representative test report for an ISTMT test if the differences between the tested product and the products represented by the report are unlikely to affect the final ISTMT result. For

example, we **will accept** one ISTMT test report to represent a series of products with the same wattage, LED chip and the electrical circuit, but with the following minor differences:

- lens material (glass vs plastic), lens design (frost vs. clear), type of cap (B22 vs E27), beam angle, light distribution (narrow, wide or oval optics), or superficial differences such as the luminaire colour or differences between installation brackets
- LED chip differences such as CCT, CRI, chromaticity coordinates, voltage bin, or flux bin.

The laboratory report must list all the differences between the lamps and provide photographic evidence of all lamps represented by the test report. The tests must be conducted on the product with the highest drive current. If the drive currents are identical across the products, test must be conducted on the product with the lowest correlated colour temperature (CCT).

We **will not accept** a representative test report in the following circumstances:

- products with different chips or different wattages
- products with additional electrical circuits (motion sensors, Wi-Fi components etc.)
- products with different thermal masses
- dimmable or non-dimmable versions of the same luminaire
- products with varying values of LCPs.

We may decide to request additional ISTMT reports if we believe that an ISTMT report is not representative of the performance of a luminaire.

### **1.5. When can I submit a representative test report for IP tests**

You must submit a test report to confirm ingress protection (IP) rating of lamps designed for outdoor environments, including reflector lamps and non-building based lighting products.

You may submit one test report to represent several products if all the following criteria are met:

- all proposed lamps have the same external construction (housing) when compared to the tested model (the test laboratory must confirm this with relevant photographic evidence)
- statement from the laboratory that the results of the IP report applies to all models listed on the product application  
the safety certificate must contain the model and corresponding IP rating for all lamps represented by the IP test report.

### **1.6. When can I submit a representative test report for CISPR tests?**

CISPR reports must be issued in the exact brand and model as the product applied for, except as follows: We will accept one CISPR test report to represent a series of products with the same wattage where those products share the same chip and circuitry.

Products with differing wattages chips or circuitry will need to submit separate CISPR reports. Brand/model reconciliation documents are not accepted for CISPR reports.

### **1.7. Can a lighting product approved for product category 34 also be submitted for approval for product category 27 and/or 35?**

Existing approved building based lighting upgrade products (product category 34) may be submitted for listing as a public lighting upgrade product (product category 27) and/or non-building based lighting upgrade product (product category 35) on our Register of Products.

Existing approved building based lighting upgrade products (product category 34) may be approved under either public lighting upgrade product (product category 27) and/or non-building based lighting upgrade product (product category) by lodging a new product application for these product types for that brand and model via the online product application tool. A new application must be submitted with supporting documents under the product category.

### **1.8. Performance and safety testing of approved lighting products**

We may undertake independent performance and safety testing (in consultation with Energy Safe Victoria) to ensure that products listed on our Register of Products meet the minimum criteria in the VEET Regulations and/or the minimum energy efficiency requirements in the VEU specifications. It is a condition of listing on the Register of Products that an applicant submits a product for testing upon request by us. Please note that up to six samples per product must be supplied at the applicant's expense should testing be required. We may modify the register at any time on the basis of new information received, including the results from independent testing.

Failure to submit an approved product for testing may result in the product being removed from our Register of Products.

## 2. Product performance and documentation requirements

### 2.1. How to use the product criteria and evidentiary tables

This section details the program's minimum product performance requirements and eligibility criteria and the evidentiary requirements for each product category that must be submitted to us in support of your application to have a product listed on the Register of products.

Each table corresponds to the relevant schedule to which the product belongs and lists the minimum requirements and the documentary evidence that must be submitted to demonstrate compliance. Applicants should also consult the VEET Regulations and VEU Specifications when preparing your documentary evidence.

For most of the product categories listed below, you will be required to submit an independent third party verification of the product performance against established safety and performance standards, such as a test report from an accredited laboratory.

The capacity of a product to perform to specified standards is a requirement of listing on the Register of Products and the valid creation of VEECs. We do not accept deviations from the listed standards unless otherwise specified. If you are unable to provide sufficient evidence that a product is capable of meeting the minimum criteria, the product will not be approved.

## 2.2. Incandescent lighting (product category 21)

### Product category 21A: LED GLS lamp

We are currently finalising our product requirements for this product category given a number of risks identified by us and program stakeholders for this activity/product.

### Product category 21B: LED lamp replacement of reflector

Attribute	Product criteria	Documentary evidence	Min. test sample size
Minimum true power factor	≥ 0.55 or ≥ 0.9 for high power factor.	<ul style="list-style-type: none"> <li>• Test report:-                             <ul style="list-style-type: none"> <li>– using IES LM-79-08 or other methodology from a laboratory accredited by NATA or equivalent body</li> <li>– must include a photograph that clearly shows the product with the original product label listing the exact brand and model of the product applied for*</li> </ul> </li> <li>• Documentation showing the laboratory is accredited to perform IES LM-79-08 (if required).</li> </ul>	10
Minimum CRI	Average ≥ 80.	<ul style="list-style-type: none"> <li>• Test report:-                             <ul style="list-style-type: none"> <li>– using IES LM-79-08 or other methodology from a laboratory accredited by NATA or equivalent body</li> <li>– must include a photograph that clearly shows the product with the original product label listing the exact brand and model of the product applied for*</li> </ul> </li> <li>• Documentation showing the laboratory is accredited to perform IES LM-79-08.</li> </ul>	10
Light output	If the lamp is to be installed in an external environment, 950 lumens.		
Minimum lighting source efficacy	45 lumens/watt.		

Attribute	Product criteria	Documentary evidence	Min. test sample size
levels			
Colour temperature	A colour temperature that is, or can be set to, <ul style="list-style-type: none"> <li>warm white (2700K to 3500K) or</li> <li>cool white (3500K to 4000K).</li> </ul>		
Maximum premature LED chip failure rate	10% of IES LM-80-08 or ANSI/IES LM-80-15 sample.	<ul style="list-style-type: none"> <li><b>IES LM-80-08 or ANSI/IES LM-80-15 test report</b> from a laboratory accredited by NATA or equivalent body to perform IES LM-80-08 or ANSI/IES LM-80-15.</li> <li>In-situ temperature measurement test (ISTMT): <ul style="list-style-type: none"> <li>conducted on one sample</li> <li>using Section 12.4.1 of IEC 60598.1 (or equivalent) or clause 14 of ANSI/UL 1598 from a laboratory accredited by NATA or equivalent body to perform that test. The ISTMT must be conducted in accordance with Annex A of IES LM-84-14 (the testing laboratory <b>is not</b> required to be accredited to LM-84-14)</li> <li>the ISTMT must be conducted at 230V (+10%/-6%), 50 Hz</li> </ul> </li> <li>The <b>ISTMT report</b> must be issued in the <b><u>exact brand and model</u></b> of each product applied for and include: <ul style="list-style-type: none"> <li>statement that the ISTMT was conducted in accordance with annex A of IES LM-84-14 (the laboratory <b>is not</b> required to be accredited to IES LM-84-14)</li> <li>the brand and model of the LED chip(s)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>10 (LM-80/TM-21)</li> <li>1 (ISTMT).</li> </ul>
Lifetime	L <sub>70</sub> (70% of original lamp		

Attribute	Product criteria	Documentary evidence	Min. test sample size
	light output) at 12,000 hours.	<ul style="list-style-type: none"> <li>– the forward current** of the LED chip(s)</li> <li>– clear photos:               <ul style="list-style-type: none"> <li>○ identifying the product</li> <li>○ showing the original product label listing the exact brand and model of the product applied for<sup>1</sup></li> <li>○ showing the exact position of the thermocouple.</li> </ul> </li> </ul> <p><i>** 'Forward current' is the current that flows under the application of a forward voltage, e.g. the DC forward current for a LED may be 30 mA when a forward voltage of 2.0 V is applied.</i></p> <p>Notes:</p> <ul style="list-style-type: none"> <li>• The ISTMT temperature and LED chip forward current of the tested product must be equal to or lower than the highest temperature and/or forward current tested in the IES LM-80-08 or ANSI/IES LM-80-15 report or the lifetime of the product cannot be established and it will not be approved.</li> <li>• The ISTMT test report must explain how the forward current of the LED chip was determined. The laboratory may explain forward current using the construction of the LEDs within the luminaire such as the parallel LED arrays (strings), number of LED</li> </ul>	

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<sup>1</sup> This requirement is mandatory for test reports issued on or after 1 May 2017 and optional for test reports issued before this date

Attribute	Product criteria	Documentary evidence	Min. test sample size
		<p>chips in an array, average drive current of a LED array, and/or total drive current of the COB<sup>2</sup>.</p> <ul style="list-style-type: none"> <li>• Manufacturer's declaration stating: <ul style="list-style-type: none"> <li>– the brand and model of the LED chip supplied with each brand and model of lamp applied for</li> <li>– the forward current of the LED chip(s) used in each lamp when operating under normal Australian conditions.</li> </ul> </li> <li>• IES TM-21-11 test report: <ul style="list-style-type: none"> <li>– produced by a laboratory accredited by NATA or equivalent body to perform IES LM-80-08 or ANSI/IES LM-80-15</li> <li>– based on the corresponding IES LM-80-08 or ANSI/IES LM-80-15 test report</li> <li>– IES LM-80-08 or ANSI/IES LM-80-15 reports that contain a TM-21-11 calculation are acceptable.</li> </ul> </li> <li>• <b>Scope of accreditation</b> document for each testing laboratory.</li> </ul>	
EMC	Compliance with AS/NZS CISPR 15:2017.	<ul style="list-style-type: none"> <li>• Test report:- <ul style="list-style-type: none"> <li>– using AS/NZS CISPR 15:2017 from a laboratory accredited by NATA or equivalent body</li> <li>– must include a photograph that clearly shows the product with the original product</li> </ul> </li> </ul>	5

<sup>2</sup> Applicable for all ISTMT test reports produced on or after 1<sup>st</sup> August 2018.

Attribute	Product criteria	Documentary evidence	Min. test sample size
		<p>label listing the exact brand and model of the product applied for<sup>3</sup></p> <ul style="list-style-type: none"> <li>Documentation showing the laboratory is accredited to perform AS/NZS CISPR 15:2017.</li> </ul>	
Safety	Lamp complies with relevant Australian safety standards.	<p>Safety certificate issued by a state government safety body or JAS-ANZ accredited approval provider.</p> <p><i>Note: Each safety certificate must be issued in the exact brand and model as the product applied for. Band/model reconciliation documents are not accepted for safety.</i></p>	N/A
Dimmable	If the lamp is to be installed in a dimmable circuit, is approved by the manufacturer as suitable for such a circuit.	Manufacturer's declaration or product specifications (if required).	N/A

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<sup>3</sup> This requirement is mandatory for test reports issued on or after 1 May 2017 and optional for test reports issued before this date.

Attribute	Product criteria	Documentary evidence	Min. test sample size
Ingress protection (IP)	If the lamp is to be installed in an external environment, a rating of IP44.	<ul style="list-style-type: none"> <li>• Test report:-               <ul style="list-style-type: none"> <li>– using AS 60529-2004 from a laboratory accredited by NATA or equivalent body [or equivalent standard IEC 60529 Ed.2.1 2001 or IEC 60529 (1989) with Amendment 1(1999)] conducted on one sample.</li> <li>– must include a photograph that clearly shows the product with the original product label listing the exact brand and model of the product applied for.</li> </ul> </li> <li>• Documentation showing the laboratory is accredited to perform AS 60529-2004 or equivalent standard IEC 60529 Ed.2.1 2001 or IEC 60529 (1989) with Amendment 1(1999)</li> </ul>	1

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## Product Category 21C: 12V non-integrated LED lamp

Attribute	Product criteria	Documentary evidence	Min. test sample size
Minimum true power factor	<p>The combined lamp circuit power factor of the tested lamp and transformer must be <math>\geq 0.7</math> if the lamp is to be installed in residential premises or <math>\geq 0.9</math> if the lamp is to be installed in business or other non-residential premises.</p> <p>The test must be conducted with a transformer designed for non-integrated lamp. The lamp will only be approved for installation with the same type of transformer (magnetic or electronic) that it was tested with.</p>	<ul style="list-style-type: none"> <li>• Test report:                             <ul style="list-style-type: none"> <li>– using IES LM-79-08 or other methodology from a laboratory accredited by National Association of Testing Authorities (NATA) or equivalent body</li> <li>– must include a photograph that clearly shows the product with the original product label listing the exact brand and model of the product applied for<sup>4</sup></li> </ul> </li> <li>• Documentation showing the laboratory is accredited to perform IES LM-79-08 (if required).</li> </ul>	10
Minimum CRI	Average $\geq 80$ .	<ul style="list-style-type: none"> <li>• Test report:                             <ul style="list-style-type: none"> <li>– using IES LM-79-08 from a laboratory accredited by NATA or equivalent body</li> <li>– must include a photograph that clearly shows the product with the original product label listing the exact brand and model of the product applied for<sup>5</sup></li> </ul> </li> </ul>	10
Minimum lighting source efficacy level	52 lumens/watt.		
Minimum light output	420 lumens in the forward direction.		
Colour temperature	A colour temperature that is, or can be set to,		

<sup>4</sup> This requirement is mandatory for test reports issued on or after 1 May 2017 and optional for test reports issued before this date.

<sup>5</sup> This requirement is mandatory for test reports issued on or after 1 May 2017 and optional for test reports issued before this date

Attribute	Product criteria	Documentary evidence	Min. test sample size
	<ul style="list-style-type: none"> <li>warm white (2700K to 3500K) or</li> <li>cool white (3500K to 4000K).</li> </ul>	<ul style="list-style-type: none"> <li>Documentation showing the laboratory is accredited to perform IES LM-79-08.</li> </ul>	
Beam angle	If the lamp is to be installed in residential premises, has a beam angle $\geq 55$ degrees when determined in accordance with IEC/TR 61341 Edition 2.0.	<ul style="list-style-type: none"> <li>Test report: <ul style="list-style-type: none"> <li>using IEC/TR 61341 Edition 2.0 from a laboratory accredited by NATA or equivalent body (if required)</li> <li>must include a photograph that clearly shows the product with the original product label listing the exact brand and model of the product applied for<sup>6</sup></li> </ul> </li> <li>Documentation showing the laboratory is accredited to perform IEC/TR 61341 Edition 2.0, IES-LM79-08 or equivalent (if required).</li> </ul>	1
Maximum premature LED chip failure rate	10% of IES LM-80-08 or ANSI/IES LM-80-15 sample.	<ul style="list-style-type: none"> <li>IES LM-80-08 or ANSI/IES LM-80-15 test report from a laboratory accredited by NATA or equivalent body to perform IES LM-80-08 or ANSI/IES LM-80-15.</li> </ul>	<ul style="list-style-type: none"> <li>10 (LM-80/TM-21)</li> <li>1 (ISTMT)</li> </ul>
Lifetime	L <sub>70</sub> (70% of original lamp light output) at 15,000 hours.	<ul style="list-style-type: none"> <li>In-situ temperature measurement test (ISTMT): <ul style="list-style-type: none"> <li>conducted on one sample</li> <li>using section 12.4.1 of IEC 60598.1 (or equivalent) or clause 14 of ANSI/UL 1598 from a laboratory accredited by NATA or</li> </ul> </li> </ul>	

<sup>6</sup> This requirement is mandatory for test reports issued on or after 1 May 2017 and optional for test reports issued before this date.

Attribute	Product criteria	Documentary evidence	Min. test sample size
		<p>equivalent body to perform that test. The ISTMT must be conducted in accordance with annex A of IES LM-84-14 (the testing laboratory <u>is not</u> required to be accredited to LM-84-14)</p> <ul style="list-style-type: none"> <li>– the ISTMT must be conducted at 230V (+10%/-6%), 50 Hz with a representative magnetic or electronic transformer designed for halogen lamps</li> <li>– the ISTMT must be conducted at ambient temperature of 25°C.</li> <li>• The <b>ISTMT report</b> must be issued in the <b><u>exact brand and model</u></b> of each product applied for and include: <ul style="list-style-type: none"> <li>– statement that the ISTMT was conducted in accordance with annex A of IES LM-84-14 (the laboratory <u>is not</u> required to be accredited to IES LM-84-14)</li> <li>– the brand and model of the LED chip(s)</li> <li>– the forward current** of the LED chip(s)</li> <li>– clear photos: <ul style="list-style-type: none"> <li>○ identifying the product</li> <li>○ showing the original product label listing the exact brand and model of the product applied for*</li> <li>○ showing the exact position of the thermocouple.</li> </ul> </li> </ul> </li> </ul> <p><b>** 'Forward current' is the current that flows under the application of a forward voltage. e.g., the DC forward current for a LED may be 30 mA when a forward voltage of 2.0 V is applied.</b></p>	

Attribute	Product criteria	Documentary evidence	Min. test sample size
		<p>Notes:</p> <ul style="list-style-type: none"> <li>• The ISTMT temperature and LED chip forward current of the tested product must be equal to or lower than the highest temperature and/or forward current tested in the IES LM-80-08 or ANSI/IES LM-80-15 report or the lifetime of the product cannot be established and it will not be approved.</li> <li>• The ISTMT test report must explain how the forward current of the LED chip was determined. The laboratory may explain forward current using the construction of the LEDs within the luminaire such as the parallel LED arrays (strings), number of LED chips in an array, average drive current of a LED array, and/or total drive current of the COB<sup>7</sup>.</li> <li>• Manufacturer's declaration stating: <ul style="list-style-type: none"> <li>– the brand and model of the LED chip supplied with each brand and model of lamp applied for</li> <li>– the forward current of the LED chip(s) used in each lamp when operating under normal Australian conditions.</li> </ul> </li> <li>• IES TM-21-11 test report: <ul style="list-style-type: none"> <li>– produced by a laboratory accredited by NATA or equivalent</li> </ul> </li> </ul>	

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<sup>7</sup> Applicable for all ISTMT test reports produced on or after 1<sup>st</sup> August 2018.

Attribute	Product criteria	Documentary evidence	Min. test sample size
		<p>body to perform IES LM-80-08 or ANSI/IES LM-80-15</p> <ul style="list-style-type: none"> <li>– based on the corresponding IES LM-80-08 or ANSI/IES LM-80-15 test report</li> <li>– IES LM-80-08 or ANSI/IES LM-80-15 reports that contain a TM-21-11 calculation are acceptable.</li> </ul> <ul style="list-style-type: none"> <li>• <b>Scope of accreditation</b> document for each testing laboratory.</li> </ul>	
EMC (Electromagnetic compatibility)	Compliance with AS/NZS CISPR 15:2017.	<ul style="list-style-type: none"> <li>• Test report: <ul style="list-style-type: none"> <li>– using AS/NZS CISPR 15:2017 from a laboratory accredited by NATA or equivalent body</li> <li>– must include a photograph that clearly shows the product with the original product label listing the exact brand and model of the product applied for<sup>8</sup></li> </ul> </li> <li>• Documentation showing the laboratory is accredited to perform AS/NZS CISPR 15:2017</li> </ul>	5
Transformer compatibility	The non-integrated LED lamp must be compatible with the type of extra-low voltage lighting converter used with the decommissioned lamp	Manufacturer's declaration or product specifications listing compatible transformers.	N/A

<sup>8</sup> This requirement is mandatory for test reports issued on or after 1 May 2017 and optional for test reports issued before this date.

Attribute	Product criteria	Documentary evidence	Min. test sample size
Dimmable	If the lamp is to be installed in a dimmable circuit, is approved by the manufacturer as suitable for such a circuit.	Manufacturer's declaration or product specifications (if required).	N/A

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## Product category 21D: Mains voltage downlight LED luminaire

Attribute	Product criteria	Documentary evidence	Min. test sample size
Minimum true power factor	<p>≥ 0.55 or ≥ 0.9 for high power factor multiplier.</p> <p>The test must be conducted with the driver the lamp is supplied with. The lamp will only be approved for installation with the same driver it was tested with.</p>	<ul style="list-style-type: none"> <li>• Test report: <ul style="list-style-type: none"> <li>– using IES LM-79-08 or other methodology from a laboratory accredited by National Association of Testing Authorities (NATA) or equivalent body</li> <li>– must include a photograph that clearly shows the product with the original product label listing the exact brand and model of the product applied for and, where relevant, the exact brand and model of the remote control gear supplied with the product</li> </ul> </li> <li>• Documentation showing the laboratory is accredited to perform IES LM-79-08 (if required).</li> </ul>	10
Minimum CRI	Average ≥ 80.	<ul style="list-style-type: none"> <li>• Test report: <ul style="list-style-type: none"> <li>– using IES LM-79-08 from a laboratory accredited by NATA or equivalent body</li> <li>– must include a photograph that clearly shows the product with the original product label listing the exact brand and model of the product applied for and, where relevant, the exact brand and model of the remote control gear supplied with the product</li> </ul> </li> <li>• Documentation showing the laboratory is accredited to perform IES LM-79-08.</li> </ul>	10
Lighting source efficacy	48 lumens/watt.		
Light output	400 lumens in the forward direction.		
Colour temperature	<p>A colour temperature that is, or can be set to either,</p> <ul style="list-style-type: none"> <li>• warm white (2700K to 3500K)</li> <li>• cool white (3500K to 4000K).</li> </ul>		

Attribute	Product criteria	Documentary evidence	Min. test sample size
Beam angle	If the lamp is to be installed in residential premises, has a beam angle $\geq 40$ degrees when determined in accordance with IEC/TR 61341 Edition 2.0.	<ul style="list-style-type: none"> <li>• Test report               <ul style="list-style-type: none"> <li>– using IEC/TR 61341 Edition 2.0 from a laboratory accredited by NATA or equivalent body (if required)</li> <li>– test report must include a photograph that clearly shows the product with the original product label listing the exact brand and model of the product applied for*</li> </ul> </li> <li>• Documentation showing the laboratory is accredited to perform IEC/TR 61341 Edition 2.0, IES-LM79-08 or equivalent (if required).</li> </ul>	1
Maximum premature LED chip failure rate	10% of IES LM-80-08 or ANSI/IES LM-80-15 sample.	<ul style="list-style-type: none"> <li>• IES LM-80-08 or ANSI/IES LM-80-15 test report from a laboratory accredited by NATA or equivalent body to perform IES LM-80-08 or ANSI/IES LM-80-15.</li> <li>• In-situ temperature measurement test (ISTMT):               <ul style="list-style-type: none"> <li>– conducted on one sample</li> <li>– using Section 12.4.1 of IEC 60598.1 (or equivalent) or Clause 14 of ANSI/UL 1598 from a laboratory accredited by NATA or equivalent body to perform that test. The ISTMT must be conducted in accordance with Annex A of IES LM-84-14 (the testing laboratory <b>is not</b> required to be accredited to LM-84-14)</li> <li>– the ISTMT must be conducted at 230V (+10%/-6%), 50 Hz with the control gear supplied with the lamp.</li> <li>– The ISTMT must be conducted at ambient temperature of 25°C.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• 10 (LM-80/TM-21)</li> <li>• 1 (ISTMT)</li> </ul>
Lifetime	$L_{70}$ (70% of original lamp light output) at 15,000 hours.	<ul style="list-style-type: none"> <li>– The ISTMT must be conducted at ambient temperature of 25°C.</li> </ul>	

Attribute	Product criteria	Documentary evidence	Min. test sample size
		<ul style="list-style-type: none"> <li>• The ISTMT report must be issued in the <b><u>exact brand and model</u></b> of each product applied for and include:               <ul style="list-style-type: none"> <li>– statement that the ISTMT was conducted in accordance with Annex A of IES LM-84-14 (the laboratory <b><u>is not</u></b> required to be accredited to IES LM-84-14)</li> <li>– the brand and model of the LED chip(s)</li> <li>– the forward current** of the LED chip(s)</li> <li>– clear photos;                   <ul style="list-style-type: none"> <li>○ identifying the product</li> <li>○ showing the original product label listing the exact brand and model of the product applied for and, where relevant, the original product label listing the exact brand and model of the remote control gear supplied with the product.<sup>9</sup></li> <li>○ showing the exact position of the thermocouple.</li> </ul> </li> </ul> </li> </ul> <p>** 'Forward current' is the current that flows under the application of a forward voltage. e.g., the DC forward current for a LED may be 30 mA when a forward voltage of 2.0 V is applied.</p> <p>Notes:</p> <ul style="list-style-type: none"> <li>• The ISTMT temperature and LED chip forward current of the</li> </ul>	

<sup>9</sup> This requirement is mandatory for test reports issued on or after 1 May 2017 and optional for test reports issued before this date.

Attribute	Product criteria	Documentary evidence	Min. test sample size
		<p>tested product must be equal to or lower than the highest temperature and/or forward current tested in the IES LM-80-08 or ANSI/IES LM-80-15 report or the lifetime of the product cannot be established and it will not be approved.</p> <ul style="list-style-type: none"> <li>• The ISTMT test report must explain how the forward current of the LED chip was determined. The laboratory may explain forward current using the construction of the LEDs within the luminaire such as the parallel LED arrays (strings), number of LED chips in an array, average drive current of a LED array, and/or total drive current of the COB<sup>10</sup>.</li> <li>• Manufacturer's declaration stating: <ul style="list-style-type: none"> <li>– the brand and model of the LED chip supplied with each brand and model of lamp applied for</li> <li>– the forward current of the LED chip(s) used in each lamp when operating under normal Australian conditions.</li> </ul> </li> <li>• IES TM-21-11 test report: <ul style="list-style-type: none"> <li>– produced by a laboratory accredited by NATA or equivalent body to perform IES LM-80-08 or ANSI/IES LM-80-15</li> <li>– based on the corresponding IES LM-80-08 or ANSI/IES LM-80-</li> </ul> </li> </ul>	

<sup>10</sup> Applicable for all ISTMT test reports produced on or after 1st August 2018

Attribute	Product criteria	Documentary evidence	Min. test sample size
		<p>15 test report</p> <ul style="list-style-type: none"> <li>– IES LM-80-08 or ANSI/IES LM-80-15 reports that contain a TM-21-11 calculation are acceptable.</li> <li>• <b>Scope of accreditation</b> document for each testing laboratory.</li> </ul>	
EMC	Compliance with AS/NZS CISPR 15:2017.	<ul style="list-style-type: none"> <li>• Test report: <ul style="list-style-type: none"> <li>– using AS/NZS CISPR 15:2017 from a laboratory accredited by NATA or equivalent body</li> <li>– must include a photograph that clearly shows the product with the original product label listing the exact brand and model of the product applied for and, where relevant, the exact brand and model of the remote control gear supplied with the product<sup>11</sup></li> </ul> </li> <li>• Documentation showing the laboratory is accredited to perform AS/NZS CISPR 15:2017.</li> </ul>	5
Safety	Driver/luminaire complies with relevant Australian safety standards.	<p>Safety certificate issued by a state government safety body or JAS-ANZ accredited approval provider.</p> <p><i>Note: Each safety certificate must be issued in the exact brand and model as the product applied for. Brand/model reconciliation</i></p>	N/A

<sup>11</sup> This requirement is mandatory for test reports issued on or after 1 May 2017 and optional for test reports issued before this date.

Attribute	Product criteria	Documentary evidence	Min. test sample size
		<i>documents are not accepted for safety.</i>	
Dimmable	If the lamp is to be installed in a dimmable circuit, is approved by the manufacturer as suitable for such a circuit.	Manufacturer's declaration or product specifications (if required).	N/A

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### Activity 21E: LED lamp with integrated driver and GU10 base

Attribute	Product criteria	Documentary evidence	Min. test sample size
GU10 base	Must be an LED lamp with integrated driver and GU10 base	Product specification sheet.	N/A
Minimum true power factor	$\geq 0.55$ or $\geq 0.9$ for high power factor multiplier	<ul style="list-style-type: none"> <li>• Test report:                             <ul style="list-style-type: none"> <li>– using IES LM-79-08 or other methodology from a laboratory accredited by National Association of Testing Authorities (NATA) or equivalent body.</li> <li>– must include a photograph that clearly shows the product with the original product label listing the exact brand and model of the product applied for<sup>12</sup></li> </ul> </li> <li>• Documentation showing the laboratory is accredited to perform IES LM-79-08 (if required).</li> </ul>	10
Minimum CRI	Average $\geq 80$ .	<ul style="list-style-type: none"> <li>• Test report:                             <ul style="list-style-type: none"> <li>– using IES LM-79-08 from a laboratory accredited by NATA or equivalent body</li> <li>– must include a photograph that clearly shows the product with the original product label listing the exact brand and model of the product applied for<sup>13</sup></li> </ul> </li> </ul>	10
Lighting source efficacy	48 lumens/watt.		
Light output	400 lumens in the forward direction.		
Colour temperature	A colour temperature that is, or can be set to either,		

<sup>12</sup> This requirement is mandatory for test reports issued on or after 1 May 2017 and optional for test reports issued before this date.

Attribute	Product criteria	Documentary evidence	Min. test sample size
	<ul style="list-style-type: none"> <li>warm white (2700K to 3500K)</li> <li>cool white (3500K to 4000K).</li> </ul>	<ul style="list-style-type: none"> <li>Documentation showing the laboratory is accredited to perform IES LM-79-08.</li> </ul>	
Beam angle	If the lamp is to be installed in residential premises, has a beam angle $\geq 55$ degrees when determined in accordance with IEC/TR 61341 edition 2.0.	<ul style="list-style-type: none"> <li>Test report: <ul style="list-style-type: none"> <li>using IEC/TR 61341 edition 2.0 from a laboratory accredited by NATA or equivalent body (if required)</li> <li>the test report must include a photograph that clearly shows the product with the original product label listing the exact brand and model of the product applied for</li> </ul> </li> <li>Documentation showing the laboratory is accredited to perform IEC/TR 61341 Edition 2.0, IES-LM79-08 or equivalent (if required).</li> </ul>	1
Maximum premature LED chip failure rate	10% of IES LM-80-08 or ANSI/IES LM-80-15 sample.	<ul style="list-style-type: none"> <li><b>IES LM-80-08 or ANSI/IES LM-80-15 test report</b> from a laboratory accredited by NATA or equivalent body to perform IES LM-80-08 or ANSI/IES LM-80-15.</li> <li>In-situ temperature measurement test (ISTMT): <ul style="list-style-type: none"> <li>conducted on one sample</li> <li>using section 12.4.1 of IEC 60598.1 (or equivalent) or clause 14 of</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>10 (LM-80/TM-21)</li> <li>1 (ISTMT).</li> </ul>
Lifetime	L <sub>70</sub> (70% of original lamp light output) at 15,000 hours.		

<sup>13</sup> This requirement is mandatory for test reports issued on or after 1 May 2017 and optional for test reports issued before this date.

Attribute	Product criteria	Documentary evidence	Min. test sample size
		<p>ANSI/UL 1598 from a laboratory accredited by NATA or equivalent body to perform that test. The ISTMT must be conducted in accordance with annex A of IES LM-84-14 (the testing laboratory <b>is not</b> required to be accredited to LM-84-14)</p> <ul style="list-style-type: none"> <li>– must be conducted at 230V(+10%/-6%), 50 Hz with the control gear supplied with the lamp</li> <li>– must be conducted at ambient temperature of 25°C.</li> </ul> <ul style="list-style-type: none"> <li>• The <b>ISTMT report</b> must be issued in the <b>exact brand and model</b> of each product applied for and include: <ul style="list-style-type: none"> <li>– statement that the ISTMT was conducted in accordance with annex A of IES LM-84-14 (the laboratory <b>is not</b> required to be accredited to IES LM-84-14)</li> <li>– the brand and model of the LED chip(s)</li> <li>– the forward current** of the LED chip(s)</li> <li>– clear photos: <ul style="list-style-type: none"> <li>○ identifying the product</li> <li>○ showing the original product label listing the exact brand and model of the product applied for*</li> <li>○ showing the exact position of the thermocouple.</li> </ul> </li> </ul> </li> </ul> <p>** 'Forward current' is the current that flows under the application of a forward voltage. e.g., the DC forward current for a LED may be 30 mA when a forward voltage of 2.0 V is applied.</p>	

Attribute	Product criteria	Documentary evidence	Min. test sample size
		<p><u>Notes:</u></p> <ul style="list-style-type: none"> <li>• The ISTMT temperature and LED chip forward current of the tested product must be equal to or lower than the highest temperature and/or forward current tested in the IES LM-80-08 or ANSI/IES LM-80-15 report or the lifetime of the product cannot be established and it will not be approved.</li> <li>• The ISTMT test report must explain how the forward current of the LED chip was determined. The laboratory may explain forward current using the construction of the LEDs within the luminaire such as the parallel LED arrays (strings), number of LED chips in an array, average drive current of a LED array, and/or total drive current of the COB<sup>14</sup>.</li> <li>• Manufacturer’s declaration stating: <ul style="list-style-type: none"> <li>– the brand and model of the LED chip supplied with each brand and model of lamp applied for</li> <li>– the forward current of the LED chip(s) used in each lamp when operating under normal Australian conditions.</li> </ul> </li> <li>• IES TM-21-11 test report: <ul style="list-style-type: none"> <li>– produced by a laboratory accredited by NATA or equivalent body to</li> </ul> </li> </ul>	

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<sup>14</sup> Applicable for all ISTMT test reports produced on or after 1st August 2018

Attribute	Product criteria	Documentary evidence	Min. test sample size
		<p>perform IES LM-80-08 or ANSI/IES LM-80-15</p> <ul style="list-style-type: none"> <li>– based on the corresponding IES LM-80-08 or ANSI/IES LM-80-15 test report</li> <li>– IES LM-80-08 or ANSI/IES LM-80-15 reports that contain a TM-21-11 calculation are acceptable.</li> </ul> <ul style="list-style-type: none"> <li>• <b>Scope of accreditation</b> document for each testing laboratory.</li> </ul>	
EMC	Compliance with AS/NZS CISPR 15:2017.	<ul style="list-style-type: none"> <li>• Test report: <ul style="list-style-type: none"> <li>– using AS/NZS CISPR 15:2017 from a laboratory accredited by NATA or equivalent body</li> <li>– the test report must include a photograph that clearly shows the product with the original product label listing the exact brand and model of the product applied for<sup>15</sup></li> </ul> </li> <li>• Documentation showing the laboratory is accredited to perform AS/NZS CISPR 15:2017</li> </ul>	5
Safety	Lamp complies with relevant Australian safety standards.	<p>Safety certificate issued by a state government safety body or JAS-ANZ accredited approval provider.</p> <p><i>Note: Each safety certificate must be issued in the exact brand and model as the product applied for. Brand/model reconciliation documents are not</i></p>	N/A

<sup>15</sup> This requirement is mandatory for test reports issued on or after 1 May 2017 and optional for test reports issued before this date.

Attribute	Product criteria	Documentary evidence	Min. test sample size
		<i>accepted for safety.</i>	
Dimmable	If the lamp is to be installed in a dimmable circuit, is approved by the manufacturer as suitable for such a circuit.	Manufacturer's declaration or product specifications (if required).	N/A

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## Activity 21F: Mains voltage LED integrated downlight

Attribute	Product criteria	Documentary evidence	Min. test sample size
Downlight fitting	The product must be a mains voltage downlight LED integrated luminaire.	Product specification sheet.	N/A
Minimum true power factor	$\geq 0.55$ or $\geq 0.9$ for high power factor.	<ul style="list-style-type: none"> <li>• Test report:               <ul style="list-style-type: none"> <li>– using IES LM-79-08 or other methodology from a laboratory accredited by National Association of Testing Authorities (NATA) or equivalent body</li> <li>– must include a photograph that clearly shows the product with the original product label listing the exact brand and model of the product applied for and, where relevant, the exact brand and model of the remote control gear supplied with the product<sup>16</sup></li> </ul> </li> <li>• Documentation showing the laboratory is accredited to perform IES LM-79-08 (if required).</li> </ul>	10
Minimum CRI	Average $\geq 80$ .	<ul style="list-style-type: none"> <li>• Test report:               <ul style="list-style-type: none"> <li>– using IES LM-79-08 from a laboratory accredited by NATA or equivalent body</li> </ul> </li> </ul>	10
Lighting source efficacy	48 lumens/watt.		
Light output	400 lumens in the forward direction.		

<sup>16</sup> This requirement is mandatory for test reports issued on or after 1 May 2017 and optional for test reports issued before this date.

Attribute	Product criteria	Documentary evidence	Min. test sample size
Colour temperature	A colour temperature that is, or can be set to, <ul style="list-style-type: none"> <li>• warm white (2700K to 3500K) or</li> <li>• cool white (3500K to 4000K).</li> </ul>	<ul style="list-style-type: none"> <li>– the test report must include a photograph that clearly shows the product with the original product label listing the exact brand and model of the product applied for and, where relevant, the exact brand and model of the remote control gear supplied with the product</li> <li>• Documentation showing the laboratory is accredited to perform IES LM-79-08.</li> </ul>	
Beam angle	If the product is to be installed in residential premises, the beam angle must be $\geq 40$ degrees when determined in accordance with IEC/TR 61341 edition 2.0.	<ul style="list-style-type: none"> <li>• Test report: <ul style="list-style-type: none"> <li>– using IEC/TR 61341 edition 2.0 from a laboratory accredited by NATA or equivalent body (if required)</li> <li>– must include a photograph that clearly shows the product with the original product label listing the exact brand and model of the product applied for</li> </ul> </li> <li>• Documentation showing the laboratory is accredited to perform IEC/TR 61341 Edition 2.0, IES-LM79-08 or equivalent (if required).</li> </ul>	1
Maximum premature LED chip failure rate	10% of IES LM-80-08 or ANSI/IES LM-80-15 sample.	<ul style="list-style-type: none"> <li>• IES LM-80-08 or ANSI/IES LM-80-15 test report from a laboratory accredited by NATA or equivalent body to perform IES LM-80-08 or ANSI/IES LM-80-15.</li> </ul>	<ul style="list-style-type: none"> <li>• 10 (LM-80/TM-21)</li> </ul>
Lifetime	$L_{70}$ (70% of original lamp light output) at 15,000 hours.	<ul style="list-style-type: none"> <li>• In-situ temperature measurement test (ISTMT): <ul style="list-style-type: none"> <li>– conducted on one sample</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• 1 (ISTMT)</li> </ul>

Attribute	Product criteria	Documentary evidence	Min. test sample size
		<ul style="list-style-type: none"> <li>- using section 12.4.1 of IEC 60598.1 (or equivalent) or clause 14 of ANSI/UL 1598 from a laboratory accredited by NATA or equivalent body to perform that test. The ISTMT must be conducted in accordance with annex A of IES LM-84-14 (the testing laboratory <b>is not</b> required to be accredited to LM-84-14).</li> <li>- the ISTMT must be conducted at 230V (+10%/-6%), 50 Hz with the control gear supplied with the lamp.</li> <li>- the ISTMT must be conducted at ambient temperature of 25°C.</li> <li>• The ISTMT report must be issued in the <b><u>exact brand and model</u></b> of each product applied for and include: <ul style="list-style-type: none"> <li>- statement that the ISTMT was conducted in accordance with Annex A of IES LM-84-14 (the laboratory <b>is not</b> required to be accredited to IES LM-84-14)</li> <li>- the brand and model of the LED chip(s)</li> <li>- the forward current** of the LED chip(s)</li> <li>- clear photos: <ul style="list-style-type: none"> <li>○ identifying the product</li> <li>○ showing the original product label listing the exact brand and model of the product applied for and, where relevant, the original product label listing the exact brand and model of the remote control gear supplied with the</li> </ul> </li> </ul> </li> </ul>	

Attribute	Product criteria	Documentary evidence	Min. test sample size
		<p>product*</p> <ul style="list-style-type: none"> <li>○ showing the exact position of the thermocouple.</li> </ul> <p><i>** 'Forward current' is the current that flows under the application of a forward voltage. e.g., the DC forward current for a LED may be 30 mA when a forward voltage of 2.0 V is applied.</i></p> <p>Notes:</p> <ul style="list-style-type: none"> <li>• The ISTMT temperature and LED chip forward current of the tested product must be equal to or lower than the highest temperature and/or forward current tested in the IES LM-80-08 or ANSI/IES LM-80-15 report or the lifetime of the product cannot be established and it will not be approved.</li> <li>• The ISTMT test report must explain how the LED chip forward current was determined. The laboratory may explain forward current using the construction of the LEDs within the luminaire such as the parallel LED arrays (strings), number of LED chips in an array, average drive current of a LED array, and/or total drive current of the COB<sup>17</sup>.</li> <li>• Manufacturer's declaration stating: <ul style="list-style-type: none"> <li>– the brand and model of the LED chip supplied with each</li> </ul> </li> </ul>	

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<sup>17</sup> Applicable for all ISTMT test reports produced on or after 1st August 2018

Attribute	Product criteria	Documentary evidence	Min. test sample size
		<ul style="list-style-type: none"> <li>brand and model of lamp applied for</li> <li>– the forward current of the LED chip(s) used in each lamp when operating under normal Australian conditions.</li> <li>• IES TM-21-11 test report:               <ul style="list-style-type: none"> <li>– produced by a laboratory accredited by NATA or equivalent body to perform IES LM-80-08 or ANSI/IES LM-80-15</li> <li>– based on the corresponding IES LM-80-08 or ANSI/IES LM-80-15 test report</li> <li>– IES LM-80-08 or ANSI/IES LM-80-15 reports that contain a TM-21-11 calculation are acceptable.</li> </ul> </li> <li>• <b>Scope of accreditation</b> document for each testing laboratory.</li> </ul>	
EMC	Compliance with AS/NZS CISPR 15:2017.	<ul style="list-style-type: none"> <li>• Test report:               <ul style="list-style-type: none"> <li>– using AS/NZS CISPR 15:2017 from a laboratory accredited by NATA or equivalent body</li> <li>– must include a photograph that clearly shows the product with the original product label listing the exact brand and model of the product applied for and, where relevant, the</li> </ul> </li> </ul>	5

Attribute	Product criteria	Documentary evidence	Min. test sample size
		<p>exact brand and model of the remote control gear supplied with the product<sup>18</sup></p> <ul style="list-style-type: none"> <li>Documentation showing the laboratory is accredited to perform AS/NZS CISPR 15:2017.</li> </ul>	
Safety	Product complies with relevant Australian safety standards.	<p>Safety certificate issued by a state government safety body or JAS-ANZ accredited approval provider.</p> <p><i>Note: Each safety certificate must be issued in the exact brand and model as the product applied for. Brand/model reconciliation documents are not accepted for safety.</i></p>	N/A
Dimmable	If the product is to be installed in a dimmable circuit, is approved by the manufacturer as suitable for such a circuit.	Manufacturer's declaration or product specifications (if required).	N/A

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<sup>18</sup> This requirement is mandatory for test reports issued on or after 1 May 2017 and optional for test reports issued before this date

### 2.3. Product categories 27, 34 and 35: General requirements - lighting upgrade

#### Approval documentation summary

Table 1: Summary of documentary evidence required for each light source type under product categories 27, 34 and 35 of the VEET Regulations

Product type	Documentation requirements									
	Specifications	MEPS	NLP	LCP	Lifetime	Safety	EMC	Power factor ( $\geq 0.90$ )	Compatibility range	Voltage
T5, T8 or T12 fluorescent lamp only CFL (GLS)	Lamp /LCDs	Lamp <sup>1</sup>			Lamp					
T5, T8 or T12 lamp with ballast (luminaire)	Lamp / LCDs	Lamp			Lamp	Luminaire				
LED lamp with integrated driver LED lamp with non-integrated driver or ELC LED highbay LED tube (lamp only) LED tube (luminaire) LED downlight with integral driver (240V) LED ELV downlight with 240V remote driver LED other (240V)	Lamp / control gear / luminaire / LCDs		Lamp & control gear	Lamp & control gear	Lamp	Lamp / control gear / luminaire	Lamp / control gear / luminaire			

CFL lamp Induction lamp										
LED ELV downlight (lamp only)	Lamp		Lamp	Lamp & transformer	Lamp		Lamp	Lamp & transformer	Lamp <sup>2</sup>	
VRU unit					Unit	Unit			Unit	Unit
LCD	Unit					Unit	Unit		Unit	

<sup>1</sup> MEPS registration is not required for T5, T8 or T12 fluorescent lamps with an NLP of 14W or 15W; however in such cases evidence of the NLP must be provided.

<sup>2</sup> The installer must ensure compatibility of the lamp with the existing transformer.

## 2.4. Product category 27: Public lighting upgrade products

AEMO approved products to be installed under public lighting upgrade (activity 27) are not required by the VEET Regulations to be listed on our Register of Products at the time of installation. However, from an IT systems perspective, all products need to be recorded in our Register of Products in order to create VEECs in our registry system. Accordingly, for AEMO approved products, you will need to apply to us (with minimal supporting documentation) to have a product listed on our register prior to creating VEECs for these activities.

There are two main approval pathways for public lighting upgrade products and to obtain listing on our Register of Products:

- AEMO-approved: When proposing a AEMO approved luminaire, please submit the brand, model, nominal lamp power, evidence of lamp lifetime (refer to the following table for evidentiary requirements) and a screenshot of the product listing in AEMO’s NEM Load Table<sup>19</sup>.
- Commission approved: When proposing non-AEMO-approved products, you need to submit the evidence detailed in table below to demonstrate that the product meets the program’s legislative requirements.

Attribute	Product criteria	Documentary evidence	Min. test sample size
Safety & EMC	<ul style="list-style-type: none"> <li>• Luminaire complies with AS/NZS 60598.1 and AS/NZS 60598.2.3</li> <li>• Control gear complies with AS/NZS 61347.2.13</li> </ul>	<p>Safety certificates with Regulatory Compliance Mark (RCM) issued by a state government safety body or JAS-ANZ accredited approval provider.</p> <p><i>Note: Safety certificates must be issued in the exact brand and model as the product applied for. Brand/model reconciliation documents are not accepted for safety.</i></p>	N/A
Ingress protection (IP)	<ul style="list-style-type: none"> <li>• Optical chamber is rated IP65</li> <li>• Control gear chamber is rated IP65 (unless the control gear is rated IP65, then the control gear chamber can be rated IP24).</li> </ul>	<ul style="list-style-type: none"> <li>• Test report: <ul style="list-style-type: none"> <li>– using AS 60529-2004 from a laboratory accredited by NATA or equivalent body [or equivalent standard IEC 60529 Ed.2.1 2001 or IEC 60529 (1989) with Amendment 1(1999)] conducted on one sample</li> <li>– the test report must include a photograph that clearly shows the product with the original product label listing the exact brand and</li> </ul> </li> </ul>	1

<sup>19</sup> At the time of publication, the AEMO NEM Load Table was available at [https://www.aemo.com.au/-/media/Files/Electricity/NEM/Retail\\_and\\_Metering/Metering-Procedures/NEM-Load-Tables-For-Unmetered-Connection-Points.pdf](https://www.aemo.com.au/-/media/Files/Electricity/NEM/Retail_and_Metering/Metering-Procedures/NEM-Load-Tables-For-Unmetered-Connection-Points.pdf)

Attribute	Product criteria	Documentary evidence	Min. test sample size
		<p>model of the product applied for<sup>20</sup></p> <ul style="list-style-type: none"> <li>• Documentation showing the laboratory is accredited to perform AS 60529-2004[or equivalent standard IEC 60529 Ed.2.1 2001 or IEC 60529 (1989) with Amendment 1(1999)</li> <li>• You may submit a representative test report (see Section 1.5) for a number of products if all the following criteria are met: <ul style="list-style-type: none"> <li>– All proposed lamps must have the same external construction (housing) when compared to the tested model. The test laboratory must confirm this with relevant photographic evidence</li> <li>– Statement from the laboratory must confirm that the results of the IP report apply to all models listed in the report</li> <li>– The safety certificate must list the model and corresponding IP rating for all proposed lamps.</li> </ul> </li> </ul>	
Lamp circuit power (LCP)	N/A	<ul style="list-style-type: none"> <li>• Test report: <ul style="list-style-type: none"> <li>– using IES LM-79-08 from a laboratory accredited by NATA or equivalent body</li> </ul> </li> </ul>	1
Power factor	Combined power factor of the lamp and control gear must be $\geq 0.90$ .	<ul style="list-style-type: none"> <li>– the test report must include a photograph that clearly shows the</li> </ul>	
Lighting efficacy	100 lumens/watt.		

<sup>20</sup> This requirement is mandatory for test reports issued on or after 1 May 2017 and optional for test reports issued before this date.

Attribute	Product criteria	Documentary evidence	Min. test sample size
Correlated colour temperature (CCT)	2700K to 5700K for streetlights	product with the original product label listing the exact brand and model of the product applied for and the exact brand and model of the remote control gear supplied with the product <sup>21</sup>	
Colour rendering index (CRI)	≥ 70.	<ul style="list-style-type: none"> <li>• Corresponding IES photometric files</li> <li>• Documentation showing the laboratory is accredited to perform IES LM-79-08.</li> </ul>	
Lifetime	N/A	<ul style="list-style-type: none"> <li>• <b>IES LM-80-08 or ANSI/IES LM-80-15 test report</b> from a laboratory accredited by NATA or equivalent body to perform IES LM-80-08 or ANSI/IES LM-80-15.</li> <li>• In-situ temperature measurement test (ISTMT): <ul style="list-style-type: none"> <li>– conducted on one sample</li> <li>– using Section 12.4.1 of IEC 60598.1 (or equivalent) or Clause 14 of ANSI/UL 1598 from a laboratory accredited by NATA or equivalent body to perform that test. The ISTMT must be conducted in accordance with Annex A of IES LM-84-14 (the testing laboratory <b>is not</b> required to be accredited to LM-84-14)</li> <li>– the ISTMT must be conducted at 230V (+10%/-6%), 50 Hz with</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• 10 (LM-80 / TM-21)</li> <li>• 1 (ISTMT).</li> </ul>

<sup>21</sup> This requirement is mandatory for test reports issued on or after 1 May 2017 and optional for test reports issued before this date.

Attribute	Product criteria	Documentary evidence	Min. test sample size
		<p>the control gear supplied with the lamp.</p> <ul style="list-style-type: none"> <li>– the ISTMT must be conducted at ambient temperature of 25°C.</li> <li>• The <b>ISTMT report</b> must be issued in the <b><u>exact brand and model</u></b> of each product applied for and include: <ul style="list-style-type: none"> <li>– statement that the ISTMT was conducted in accordance with Annex A of IES LM-84-14 (the laboratory <b>is not</b> required to be accredited to IES LM-84-14)</li> <li>– the brand and model of the LED chip(s)</li> <li>– the forward current** of the LED chip(s)</li> <li>– clear photos: <ul style="list-style-type: none"> <li>○ identifying the product</li> <li>○ showing the original product label listing the exact brand and model of the product applied for and the original product label listing the exact brand and model of the remote control gear supplied with the product*</li> <li>○ showing the exact position of the thermocouple.</li> </ul> </li> </ul> </li> </ul> <p><i>** 'Forward current' is the current that flows under the application of a forward voltage. e.g., the DC forward current for a LED may be 30 mA when a forward voltage of 2.0 V is applied.</i></p> <p>Notes:</p> <ul style="list-style-type: none"> <li>• ISTMT reports must be issued in the exact brand and model as the product applied for. Brand/model reconciliation documents are not</li> </ul>	

Attribute	Product criteria	Documentary evidence	Min. test sample size
		<p>accepted for ISTMT reports.</p> <ul style="list-style-type: none"> <li>• We will accept a representative ISTMT test report (see_Section 1.4) in the instances where differences between the models are not likely to influence the ISTMT result. Some examples are lamp colour temperature (CCT), CRI, lens material, holder/end cap or beam angle. However, the laboratory must declare all the differences between the lamps and provide photographic evidence of all lamps represented by the test report. The tests must be conducted on the product with the highest drive current. If the drive currents are identical, test must be conducted on the product with the lowest CCT. We require individual ISTMT tests for all other proposed products.</li> <li>• The ISTMT temperature and LED chip forward current of the tested product must be equal to or lower than the highest temperature and/or forward current tested in the IES LM-80-08 or ANSI/IES LM-80-15 report or the lifetime of the product cannot be established and it will not be approved.</li> <li>• The ISTMT test report must explain how the LED chip forward current was determined. The laboratory may explain forward current using the construction of the LEDs within the luminaire such as the parallel</li> </ul>	

Attribute	Product criteria	Documentary evidence	Min. test sample size
		<p>LED arrays (strings), number of LED chips in an array, average drive current of a LED array, and/or total drive current of the COB<sup>22</sup>.</p> <ul style="list-style-type: none"> <li>• The ISTMT temperature and LED chip forward current of the tested product must be equal to or lower than the highest temperature and/or forward current tested in the IES LM-80-08 or ANSI/IES LM-80-15 report or the lifetime of the product cannot be established and it will not be approved.</li> <li>• Manufacturer’s declaration stating: <ul style="list-style-type: none"> <li>– the brand and model of the LED chip supplied with each brand and model of lamp applied for</li> <li>– the forward current of the LED chip(s) used in each lamp when operating under normal Australian conditions.</li> </ul> </li> <li>• IES TM-21-11 test report: <ul style="list-style-type: none"> <li>– produced by a laboratory accredited by NATA or equivalent body to perform IES LM-80-08 or ANSI/IES LM-80-15</li> <li>– based on the corresponding IES LM-80-08 or ANSI/IES LM-80-15 test report</li> <li>– IES LM-80-08 or ANSI/IES LM-80-15 reports that contain a TM-21-11 calculation are acceptable.</li> </ul> </li> </ul>	

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<sup>22</sup> Applicable for all ISTMT test reports produced on or after 1st August 2018

Attribute	Product criteria	Documentary evidence	Min. test sample size
		<ul style="list-style-type: none"> <li>• <b>Scope of accreditation</b> document for each testing laboratory.</li> </ul>	
Specifications	N/A	Product specification sheet showing the specifications of the product, including (where relevant), the number of lamps contained in the luminaire.	N/A

The table below outlines the documentary evidence required for standalone LCD devices eligible for installation in public spaces.

Attribute	Product criteria	Documentary evidence	Min. test sample size
Safety & EMC	Electrical safety certificate with RCM compliance	<p>Safety certificates with Regulatory Compliance Mark (RCM) issued by a state government safety body or JAS-ANZ accredited approval provider.</p> <p><i>Note: Safety certificates must be issued in the exact brand and model as the product applied for. Brand/model reconciliation documents are not accepted for safety.</i></p>	N/A
Ingress protection (IP)	Rated IP65	<ul style="list-style-type: none"> <li>• Test report: <ul style="list-style-type: none"> <li>– using AS 60529-2004 from a laboratory accredited by NATA or equivalent body [or equivalent standard IEC 60529 Ed.2.1 2001 or IEC 60529 (1989) with Amendment 1(1999)] conducted on one</li> </ul> </li> </ul>	1

Attribute	Product criteria	Documentary evidence	Min. test sample size
		<p>sample</p> <ul style="list-style-type: none"> <li>– must include a photograph that clearly shows the product with the original product label listing the exact brand and model of the product applied for<sup>23</sup></li> <li>• Documentation showing the laboratory is accredited to perform AS 60529-2004[or equivalent standard IEC 60529 Ed.2.1 2001 or IEC 60529 (1989) with Amendment 1(1999)</li> <li>• You may submit a representative test report (see Section 1.5) for a number of products if all the following criteria are met: <ul style="list-style-type: none"> <li>– All proposed LCDs must have the same external construction (housing) when compared to the tested model. The test laboratory must confirm this with relevant photographic evidence</li> <li>– Statement from the laboratory must confirm that the results of the IP report apply to all models listed in the report</li> <li>– The safety certificate must list the model and corresponding IP rating for all proposed LCDs.</li> </ul> </li> </ul>	
Specifications	N/A	Product specification sheet showing the specifications of the product, showing functionality of the product	N/A

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<sup>23</sup> This requirement is mandatory for test reports issued on or after 1 May 2017 and optional for test reports issued before this date.

## 2.5. Product category 34: Building based lighting upgrade

Attribute	Product type	Documentary evidence
Specifications	All	<ul style="list-style-type: none"> <li>Product specification sheet showing the specifications of the product, including (where relevant), type and specifications of LCDs built into to lamps</li> <li>All lamp specifications must show an NLP value for each proposed luminaire</li> </ul>
MEPS	<ul style="list-style-type: none"> <li>T5, T8, or T12 fluorescent lamp</li> <li>CFL (GLS)</li> </ul>	Screen shot of MEPS registration details from <a href="http://www.energyrating.gov.au">www.energyrating.gov.au</a> .
NLP	<ul style="list-style-type: none"> <li>T5, T8, or T12 fluorescent lamp</li> <li>CFL (GLS)</li> </ul>	Screen shot of MEPS registration details from <a href="http://www.energyrating.gov.au">www.energyrating.gov.au</a> , manufacturer's product specification sheet or declaration.
	<ul style="list-style-type: none"> <li>Metal halide</li> <li>Mercury vapour</li> <li>High pressure sodium</li> </ul>	<ul style="list-style-type: none"> <li>Manufacturer's product specification sheet or declaration</li> <li>Specification sheet or declaration must include a photograph that clearly shows the product with the original product label listing the exact brand and model of the product applied for<sup>24</sup>.</li> </ul>
LCP	<ul style="list-style-type: none"> <li>LED highbay</li> <li>LED tube (lamp only)</li> <li>LED tube (luminaire)</li> <li>LED downlight with integral driver</li> </ul>	<ul style="list-style-type: none"> <li>Test report from laboratory accredited by NATA or equivalent body showing the combined lamp circuit power (LCP) of the lamp and control gear (in watts)</li> <li>The LCP must be tested at 230V (+10%/-6%), 50 Hz</li> <li>The LCP may be reported as a part of the ISTMT test report</li> </ul>

<sup>24</sup> This requirement is mandatory for test reports issued on or after 1 May 2017 and optional for test reports issued before this date

Attribute	Product type	Documentary evidence
	(240V) <ul style="list-style-type: none"> <li>• LED ELV downlight with 240V remote driver</li> <li>• LED other (240V)</li> <li>• CFL downlight</li> <li>• induction</li> <li>• fluorescent lamp</li> </ul>	<ul style="list-style-type: none"> <li>• Test must be conducted with the lamp and control gear the product will be supplied and installed with</li> <li>• If the safety certificate provided is for the control gear only, the LCP report must either:-               <ul style="list-style-type: none"> <li>– state the exact brand and model number of the control gear tested with the lamp.</li> <li>– screenshot of product on IPART public list of accepted emerging lighting technology showing the exact brand and model of the product applied for and the LCP. We may request further supporting documentation if required.</li> </ul> </li> </ul>
	LED ELV downlight (lamp only)	<ul style="list-style-type: none"> <li>• Test report from laboratory accredited by NATA or equivalent body showing the lamp circuit power (LCP) of the lamp and a transformer (in watts)</li> <li>• The LCP must be tested at 230V (+10%/-6%), 50 Hz</li> <li>• The LCP may be reported as a part of the ISTMT test report</li> <li>• The lamp must be tested with a representative magnetic or electronic transformer designed for halogen lamps</li> <li>• The lamp will only be approved for installation with the same type of transformer (magnetic or electronic) that it was tested with.</li> <li>• The LCP test report must include a photograph that clearly shows the product with the original product label listing the exact brand and model of the product applied for<sup>25</sup>.</li> </ul>

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<sup>25</sup> This requirement is mandatory for test reports issued on or after 1 May 2017 and optional for test reports issued before this date

Attribute	Product type	Documentary evidence
Lifetime	Non-LEDs	<ul style="list-style-type: none"> <li>• Manufacturer’s product specification sheet or declaration</li> <li>• The specification sheet must include a photograph that clearly shows the product with the original product label listing the exact brand and model of the product applied for and, where relevant, the exact brand and model of the remote control gear supplied with the product<sup>26</sup>.</li> </ul>
	LEDs	<ul style="list-style-type: none"> <li>• <b>IES LM-80-08 or ANSI/IES LM-80-15 test report</b> from a laboratory accredited by NATA or equivalent body to perform IES LM-80-08 or ANSI/IES LM-80-15.</li> <li>• The LM-80 test must be conducted under minimum of two temperatures. One of the test conditions must be either 55°C or 85°C.</li> <li>• In-situ temperature measurement test (ISTMT): <ul style="list-style-type: none"> <li>– conducted on one sample</li> <li>– using section 12.4.1 of IEC 60598.1 (or equivalent) or clause 14 of ANSI/UL 1598 from a laboratory accredited by NATA or equivalent body to perform that test. The ISTMT must be conducted in accordance with annex A of IES LM-84-14 (the testing laboratory <b>is not</b> required to be accredited to LM-84-14)</li> <li>– the ISTMT must be conducted at 230V (+10%/-6%), 50 Hz with the control gear supplied with the lamp</li> <li>– LED ELV downlights (lamp only) must be tested at 230V (+10%/-6%), 50 Hz with a representative magnetic or electronic transformer designed for halogen lamps</li> </ul> </li> </ul>

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<sup>26</sup> This requirement is mandatory for test reports issued on or after 1 May 2017 and optional for test reports issued before this date

Attribute	Product type	Documentary evidence
		<ul style="list-style-type: none"> <li>– the ISTMT must be conducted at ambient temperature of 25°C.</li> <li>• The <b>ISTMT report</b> must be issued in the <b><u>exact brand and model</u></b> of each product applied for and include: <ul style="list-style-type: none"> <li>– statement that the ISTMT was conducted in accordance with annex A of IES LM-84-14 (the laboratory <b><u>is not</u></b> required to be accredited to IES LM-84-14)</li> <li>– the brand and model of the LED chip(s)</li> <li>– the forward current** of the LED chip(s)</li> <li>– clear photos: <ul style="list-style-type: none"> <li>○ identifying the product</li> <li>○ showing the original product label listing the exact brand and model of the product applied for and, where relevant, the original product label listing the exact brand and model of the remote control gear supplied with the product*</li> <li>○ showing the exact position of the thermocouple.</li> </ul> </li> </ul> </li> </ul> <p>** <i>‘Forward current’ is the current that flows under the application of a forward voltage. e.g., the DC forward current for a LED may be 30 mA when a forward voltage of 2.0 V is applied.</i></p> <p>Notes:</p> <ul style="list-style-type: none"> <li>• ISTMT reports must be issued in the exact brand and model as the product applied for. Brand/model reconciliation documents are not accepted for ISTMT reports.</li> <li>• We will accept a representative ISTMT test report (see Section 1.4) in the instances where differences between the models are not likely to influence the ISTMT result. Some examples are lamp colour temperature (CCT), CRI, lens material, holder/end cap or beam angle. However, the laboratory must declare all the differences between the lamps and provide</li> </ul>

Attribute	Product type	Documentary evidence
		<p>photographic evidence of all lamps represented by the test report. The tests must be conducted on the product with the highest drive current. If the drive currents are identical, test must be conducted on the product with the lowest CCT. We require individual ISTMT tests for all other proposed products.</p> <ul style="list-style-type: none"> <li>• The ISTMT temperature and LED chip forward current of the tested product must be equal to or lower than the highest temperature and/or forward current tested in the IES LM-80-08 or ANSI/IES LM-80-15 report or the lifetime of the product cannot be established and it will not be approved.</li> <li>• The ISTMT test report must explain how the LED chip forward current was determined. The laboratory may explain forward current using the construction of the LEDs within the luminaire such as the parallel LED arrays (strings), number of LED chips in an array, average drive current of a LED array, and/or total drive current of the COB<sup>27</sup>.</li> <li>• The ISTMT temperature and LED chip forward current of the tested product must be equal to or lower than the highest temperature and/or forward current tested in the IES LM-80-08 or ANSI/IES LM-80-15 report or the lifetime of the product cannot be established and it will not be approved.</li> <li>• Manufacturer’s declaration stating: <ul style="list-style-type: none"> <li>– the brand and model of the LED chip supplied with each brand and model of lamp applied for</li> </ul> </li> </ul>

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<sup>27</sup> Applicable for all ISTMT test reports produced on or after 1st August 2018

Attribute	Product type	Documentary evidence
		<ul style="list-style-type: none"> <li>– the forward current of the LED chip(s) used in each lamp when operating under normal Australian conditions.</li> <li>• IES TM-21-11 test report: <ul style="list-style-type: none"> <li>– produced by a laboratory accredited by NATA or equivalent body to perform IES LM-80-08 or ANSI/IES LM-80-15</li> <li>– based on the corresponding IES LM-80-08 or ANSI/IES LM-80-15 test report</li> <li>– IES LM-80-08 or ANSI/IES LM-80-15 reports that contain a TM-21-11 calculation are acceptable.</li> </ul> </li> <li>• <b>Scope of accreditation</b> document for each testing laboratory.</li> </ul>
Safety	All relevant	<p>Safety or Regulatory Compliance Mark (RCM) issued by a state government safety body or JAS-ANZ accredited approval provider.</p> <p><i>Note: The original safety certificate and any addendums/modifications must be submitted. The safety certificate must be issued in the exact brand and model as the product applied for. Brand/model reconciliation documents are not accepted for safety.</i></p> <p>or</p> <p>Screenshot of product on the IPART public list of accepted emerging lighting technology showing the exact brand and model of the product applied for (not accepted for VRUs). We may request further supporting documentation as required.</p>
EMC	All relevant	<ul style="list-style-type: none"> <li>• Completed Australian Communications and Media Authority (ACMA) Supplier's Declaration of Conformity (listing product brand and models applied for and the supplier's code number);</li> </ul> <p>or</p>

Attribute	Product type	Documentary evidence
		<ul style="list-style-type: none"> <li>• Screen shot of product registration details on the national equipment registration system database <a href="https://equipment.erac.gov.au/Registration/">https://equipment.erac.gov.au/Registration/</a>; or</li> <li>• Regulatory Compliance Mark (RCM) certificate of approval; or</li> <li>• Screenshot of product on the IPART public list of accepted emerging lighting technology showing the exact brand and model of the product applied for (<b>not accepted</b> for LED ELV downlights – lamp only). We may request further supporting documentation as required.</li> </ul>
Power factor (≥ 0.90)	LED ELV downlight (lamp only)	<ul style="list-style-type: none"> <li>• Test report from laboratory accredited by NATA or equivalent body showing the combined power factor of the lamp and a transformer</li> <li>• The power factor must be tested at 230V (+10%/-6%), 50 Hz</li> <li>• When applicable the lamp must be tested with a representative magnetic or electronic transformer designed for halogen lamps</li> <li>• The lamp will only be approved for installation with the same type of transformer (magnetic or electronic) that it was tested with</li> <li>• The test report must include a photograph that clearly shows the product with the original product label listing the exact brand and model of the product applied for<sup>28</sup>.</li> </ul>
Compatibility range	LED ELV downlight (lamp only)	Manufacturer's product specification sheet or declaration listing all electronic and/or magnetic transformers (including dimmable transformers) that the lamp is compatible with.

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<sup>28</sup> This requirement is mandatory for test reports issued on or after 1 May 2017 and optional for test reports issued before this date.

Attribute	Product type	Documentary evidence
Voltage	VRU	<ul style="list-style-type: none"> <li>• Test report from a laboratory accredited by NATA or equivalent body showing the output voltage of the VRU</li> <li>• The test report must include a photograph that clearly shows the product with the original product label listing the exact brand and model of the product applied for<sup>29</sup></li> </ul>
LCD type	LCD	<ul style="list-style-type: none"> <li>• Product specification sheet showing type and functionality of the LCD</li> </ul>

## 2.6. Product category 35: Non-building based lighting upgrade

The tables in this section outlines the documentary evidence required for LED lamps and lighting control devices eligible for installation in non-building based environments. For instructions on how to apply for an existing approved Part 34 product to be approved as a Part 35 product, please see Section 1.7.

Attribute	Product criteria	Documentary evidence	Min. test sample size
Safety & EMC	<ul style="list-style-type: none"> <li>• Luminaire complies with AS/NZS 60598.1 and AS/NZS 60598.2.5</li> <li>• Control gear complies with AS/NZS 61347.2.13.</li> </ul>	<p>Safety certificates with Regulatory Compliance Mark (RCM) issued by a state government safety body or JAS-ANZ accredited approval provider.</p> <p><i>Note: Safety certificates must be issued in the exact brand and model as the product applied for. Brand/model reconciliation documents are not</i></p>	N/A

<sup>29</sup> This requirement is mandatory for test reports issued on or after 1 May 2017 and optional for test reports issued before this date.

Attribute	Product criteria	Documentary evidence	Min. test sample size
		<i>accepted for safety.</i>	
Ingress protection (IP)	<ul style="list-style-type: none"> <li>Optical chamber is rated IP65</li> <li>Control gear chamber is rated IP65 (unless the control gear is rated IP65, then the control gear chamber can be rated IP24).</li> </ul>	<ul style="list-style-type: none"> <li>Test report using AS 60529-2004 from a laboratory accredited by NATA or equivalent body [or equivalent standard IEC 60529 Ed.2.1 2001 or IEC 60529 (1989) with Amendment 1(1999)] conducted on one sample</li> <li>The test report must include a photograph that clearly shows the product with the original product label listing the exact brand and model of the product applied for<sup>30</sup></li> <li>Documentation showing the laboratory is accredited to perform AS 60529-2004[or equivalent standard IEC 60529 Ed.2.1 2001 or IEC 60529 (1989) with Amendment 1(1999)]</li> <li>You may submit a representative test report (see Section 1.5) for a number of products if all the following criteria are met: <ul style="list-style-type: none"> <li>all proposed lamps must have the same external construction (housing) when compared to the tested model. The test laboratory must confirm this with relevant photographic evidence</li> <li>statement from the laboratory must confirm that the results of the IP report apply to all models listed in the report</li> </ul> </li> </ul>	1

<sup>30</sup> This requirement is mandatory for test reports issued on or after 1 May 2017 and optional for test reports issued before this date.

Attribute	Product criteria	Documentary evidence	Min. test sample size
		<ul style="list-style-type: none"> <li>– the safety certificate must list the model and corresponding IP rating for all proposed lamps.</li> </ul>	
Suitability for outdoor environments	<ul style="list-style-type: none"> <li>• Luminaire complies with specific clauses of AS/NZS 60598.2.5 relevant to luminaires for use outdoors above ground level.</li> </ul>	<ul style="list-style-type: none"> <li>• Safety test report showing compliance to all aspects of Clause 5.6.5 of AS/NZS 60598.2.5</li> <li>• The test report must include a photograph that clearly shows the product with the original product label listing the exact brand and model of the product applied for and the exact brand and model of the remote control gear supplied with the product<sup>31</sup></li> <li>• Documentation showing the laboratory is accredited to perform AS/NZS 60598.2.5</li> <li>• You may submit a representative test report for a number of products from the same family, if the following criteria are met: <ul style="list-style-type: none"> <li>– A safety test report with test standard AS/NZS 60598.2.5 can be submitted for a product with the highest wattage (worst case)</li> <li>– Statement from the laboratory confirming that safety report applies to all other models</li> <li>– Safety certificate must list all proposed lamps on the same certificate.</li> </ul> </li> </ul>	1

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<sup>31</sup> This requirement is mandatory for test reports issued on or after 1 May 2017 and optional for test reports issued before this date.

Attribute	Product criteria	Documentary evidence	Min. test sample size
Lamp circuit power (LCP)	N/A	<ul style="list-style-type: none"> <li>• Test report using IES LM-79-08 from a laboratory accredited by NATA or equivalent body</li> <li>• The test report must include a photograph that clearly shows the product with the original product label listing the exact brand and model of the product applied for and the exact brand and model of the remote control gear supplied with the product<sup>32</sup></li> <li>• Corresponding IES photometric files</li> <li>• Documentation showing the laboratory is accredited to perform IES LM-79-08.</li> </ul>	1
Power factor	Combined power factor of the lamp and control gear must be $\geq 0.90$		
Lighting efficacy	100 lumens/watt		
Colour rendering index (CRI)	$\geq 70$		
Lifetime	N/A	<ul style="list-style-type: none"> <li>• <b>IES LM-80-08 or ANSI/IES LM-80-15 test report</b> from a laboratory accredited by NATA or equivalent body to perform IES LM-80-08 or ANSI/IES LM-80-15.</li> <li>• In-situ temperature measurement test (ISTMT): <ul style="list-style-type: none"> <li>– conducted on one sample</li> <li>– using Section 12.4.1 of IEC 60598.1 (or equivalent) or Clause 14 of ANSI/UL 1598 from a laboratory accredited by NATA or equivalent body to perform that test. The ISTMT must be</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• 10 (LM-80 / TM-21)</li> <li>• 1 (ISTMT).</li> </ul>

<sup>32</sup> This requirement is mandatory for test reports issued on or after 1 May 2017 and optional for test reports issued before this date.

Attribute	Product criteria	Documentary evidence	Min. test sample size
		<p>conducted in accordance with Annex A of IES LM-84-14 (the testing laboratory <b>is not</b> required to be accredited to LM-84-14)</p> <ul style="list-style-type: none"> <li>– the ISTMT must be conducted at 230V (+10%/-6%), 50 Hz with the control gear supplied with the lamp.</li> </ul> <p>The ISTMT must be conducted at ambient temperature of 25°C.</p> <ul style="list-style-type: none"> <li>• The <b>ISTMT report</b> must be issued in the <b>exact brand and model</b> of each product applied for and include: <ul style="list-style-type: none"> <li>– statement that the ISTMT was conducted in accordance with Annex A of IES LM-84-14 (the laboratory <b>is not</b> required to be accredited to IES LM-84-14)</li> <li>– the brand and model of the LED chip(s)</li> <li>– the forward current** of the LED chip(s)</li> <li>– clear photos: <ul style="list-style-type: none"> <li>○ identifying the product</li> <li>○ showing the original product label listing the exact brand and model of the product applied for and the original product label listing the exact brand and model of the remote control gear supplied with the product*</li> <li>○ showing the exact position of the thermocouple.</li> </ul> </li> </ul> </li> </ul> <p><i>** 'Forward current' is the current that flows under the application of a forward voltage. e.g., the DC forward current for a LED may be 30 mA when a forward voltage of 2.0 V is applied.</i></p>	

Attribute	Product criteria	Documentary evidence	Min. test sample size
		<p>Notes:</p> <ul style="list-style-type: none"> <li>• ISTMT reports must be issued in the exact brand and model as the product applied for. Brand/model reconciliation documents are not accepted for ISTMT reports.</li> <li>• We will accept a representative ISTMT test report (see Section 3.4) in the instances where differences between the models are not likely to influence the ISTMT result. Some examples are lamp colour temperature (CCT), CRI, lens material, holder/end cap or beam angle. However, the laboratory must declare all the differences between the lamps and provide photographic evidence of all lamps represented by the test report. The tests must be conducted on the product with the highest drive current. If the drive currents are identical, test must be conducted on the product with the lowest CCT. We require individual ISTMT tests for all other proposed products.</li> <li>• The ISTMT temperature and LED chip forward current of the tested product must be equal to or lower than the highest temperature and/or forward current tested in the IES LM-80-08 or ANSI/IES LM-80-15 report or the lifetime of the product cannot be established and it will not be approved.</li> <li>• The ISTMT test report must explain how the LED chip forward current was determined. The laboratory may explain forward current using the construction of the LEDs within the luminaire such as the parallel</li> </ul>	

Attribute	Product criteria	Documentary evidence	Min. test sample size
		<p>LED arrays (strings), number of LED chips in an array, average drive current of a LED array, and/or total drive current of the COB<sup>33</sup>.</p> <ul style="list-style-type: none"> <li>• The ISTMT temperature and LED chip forward current of the tested product must be equal to or lower than the highest temperature and/or forward current tested in the IES LM-80-08 or ANSI/IES LM-80-15 report or the lifetime of the product cannot be established and it will not be approved.</li> <li>• Manufacturer’s declaration stating: <ul style="list-style-type: none"> <li>– the brand and model of the LED chip supplied with each brand and model of lamp applied for</li> <li>– the forward current of the LED chip(s) used in each lamp when operating under normal Australian conditions.</li> </ul> </li> <li>• IES TM-21-11 test report: <ul style="list-style-type: none"> <li>– produced by a laboratory accredited by NATA or equivalent body to perform IES LM-80-08 or ANSI/IES LM-80-15</li> <li>– based on the corresponding IES LM-80-08 or ANSI/IES LM-80-15 test report</li> <li>– IES LM-80-08 or ANSI/IES LM-80-15 reports that contain a TM-21-11 calculation are acceptable.</li> </ul> </li> </ul>	

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<sup>33</sup> Applicable for all ISTMT test reports produced on or after 1st August 2018

Attribute	Product criteria	Documentary evidence	Min. test sample size
		<ul style="list-style-type: none"> <li>• <b>Scope of accreditation</b> document for each testing laboratory.</li> </ul>	
Specifications	N/A	Product specification sheet showing the specifications of the product, including , NLP and types of LCDs ( if any)	N/A

Attribute	Product Criteria	Documentary Evidence	Min. test sample size
Safety & EMC	Electrical safety certificate with RCM compliance	<p>Safety certificates with Regulatory Compliance Mark (RCM) issued by a state government safety body or JAS-ANZ accredited approval provider.</p> <p><i>Note: Safety certificates must be issued in the exact brand and model as the product applied for. Brand/model reconciliation documents are not accepted for safety.</i></p>	N/A
Ingress protection (IP)	Rated IP65	<ul style="list-style-type: none"> <li>• Test report using AS 60529-2004 from a laboratory accredited by NATA or equivalent body [or equivalent standard IEC 60529 Ed.2.1 2001 or IEC 60529 (1989) with Amendment 1(1999)] conducted on</li> </ul>	1

Attribute	Product Criteria	Documentary Evidence	Min. test sample size
		<p>one sample</p> <ul style="list-style-type: none"> <li>• The test report must include a photograph that clearly shows the product with the original product label listing the exact brand and model of the product applied for<sup>34</sup></li> <li>• Documentation showing the laboratory is accredited to perform AS 60529-2004[or equivalent standard IEC 60529 Ed.2.1 2001 or IEC 60529 (1989) with Amendment 1(1999)</li> <li>• You may submit a representative test report (see Section 1.4) for a number of products if all the following criteria are met: <ul style="list-style-type: none"> <li>– all proposed LCDs must have the same external construction (housing) when compared to the tested model. The test laboratory must confirm this with relevant photographic evidence</li> <li>– statement from the laboratory must confirm that the results of the IP report apply to all models listed in the report</li> <li>– the safety certificate must list the model and corresponding IP rating for all proposed LCDs.</li> </ul> </li> </ul>	
Specifications	N/A	Product specification sheet showing the specifications of the product, including functionality of the LCD	N/A

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<sup>34</sup> This requirement is mandatory for test reports issued on or after 1 May 2017 and optional for test reports issued before this date.

# Glossary

## General definitions

Term	Definition
Accredited body	In relation to a product, this means a body accredited under the Joint Accreditation System of Australia and New Zealand to give product certification or component certification of a product.
AEMO	Australian Energy Market Operator
AP	An accredited person is a business that has been accredited by the commission to operate within the VEU Program. An AP is entitled to create VEECs through the undertaking of energy efficient activities which are prescribed under the VEET Regulations.
Approved laboratory	Means a laboratory that is accredited by the National Association of Testing Authorities under a mutual recognition agreement.
Business/non-residential premises	Under the VEU Program, business/non-residential premises are defined as: (i) the premises that is not registered as a residential premises (see definition below), and (ii) the premises not registered as a 'scheduled activity premises' unless it has been 'opted in' to the VEU Program pursuant to Regulation 10AA of the VEET Regulations.
DNSP	Distribution network service provider
EMC	Electromagnetic compatibility
Equivalent body	A testing body recognised by NATA under a mutual recognition agreement.
ESV	Energy Safe Victoria
IPART	Independent Pricing and Regulatory Tribunal of New South Wales, the administrator of the New South Wales' Energy Savings Scheme.
NATA	National Association of Testing Authorities
RCM	Regulatory Compliance Mark
Residential premises	A building classified under part A3 of the Building Code of Australia as a class 1, 2, 3, or 4 building.
VEEC	Victorian energy efficiency certificate. Each VEEC represents one tonne of carbon dioxide equivalent (CO <sub>2</sub> -e) abated by the prescribed activity.

## Lighting-specific terms

Term	Definition
CCT	Correlated colour temperature
CRI	Colour rendering Index
ELV	Extra low voltage
Forward current	The current that flows under the application of a forward voltage.
IP	Ingress protection
ISTMT	In-situ temperature measurement test
LCD	Lighting control devices are used to control the lighting output of a light fitting, for example occupancy sensors, daylight-linked controls, programmable dimmers, manual dimmers and voltage reduction units.
LCP	Lamp circuit power, in relation to the lamp, means the power drawn by the lamp and the power drawn by any associated ballast or transformer, which is divided equally between the lamp and any other lamps associated with the ballast or transformer.
LED	Light emitting diode
Light output	The quantity and distribution of the visible light produced by a light source.
Lighting Source Efficacy	The initial luminous flux of a lamp or the total radiant flux in the visible spectrum weighted by the spectral response of the eye, divided by the electric power that will be consumed by the lamp but excluding ballast and control gear power losses.
NLP	Nominal lamp power is the manufacturer's rated value for power drawn by a single lamp.
VRU	A voltage reduction unit is a product used to reduce voltage to a light fitting.
Extra low voltage lighting converter	As per AS/NZS 4879.1; a magnetic transformer or a electronic step down converter used with ELV lamps, which, <ul style="list-style-type: none"> <li>receives an input from mains supply</li> <li>has single ELV (extra low voltage) output (either a.c. or d.c.); and</li> <li>is sold with, or intended to be used with, ELV lamps(s) that constitute the primary load</li> </ul>
CFL	Compact florescent lamp
Control gear	A device for the control of one or more light sources but does not include a lighting control device. Example: Ballasts, transformers, and step down converters such as drivers
Downlight	A luminaire mounted flush with a surface, with a light source aperture whose largest dimension is less than 20 centimetres

Term	Definition
LED integrated luminaire	A product that contains a LED device and the equipment required to distribute, filter or transform the light being transmitted and includes: <ul style="list-style-type: none"> <li>• all parts necessary for supporting, fixing and protecting the product and for connecting the product to the electricity supply; and</li> <li>• any lighting control device for the product;</li> </ul>
LED lamp with integrated driver	A self-ballasted LED module, incorporating control gear and any additional elements necessary for stable operation, that is designed for direct connection to an electricity supply
Luminaire	A non-integrated luminaire or a LED integrated luminaire;
NBB lighting	Non building based lighting is lighting undertaken under the part 35 of the VEU Regulations
Non-integrated LED lamp	A LED module where the control gear is separate from the LED module for operation under constant voltage, constant current or constant power
Non-integrated luminaire	A device that distributes, filters or transforms the light transmitted from one or more lamps that are separate from the device and includes all parts necessary for fixing and protecting the lamps and for connecting the lamps to the electricity supply;

## Document version control

The RM reference for this document is: C/18/24088

Version	Amendments made	Date published
0.1	Draft publication for release	21 November 2018