

Lighting Product Application Guide

20 February 2020



An appropriate citation for this paper is

Essential Services Commission 2020, Lighting Product Application Guide, 12 February

Copyright notice

© Essential Services Commission 2020



This work, Lighting Product Application Guide, is licensed under a Creative Commons Attribution 4.0 licence [creativecommons.org/licenses/by/4.0]. You are free to re-use the work under that licence, on the condition that you credit the Essential Services Commission as author, indicate if changes were made and comply with the other licence terms.

The licence does not apply to any brand logo, images or photographs within the publication.

Contents

Introduction	1
About this guide	1
Who should use this guide	1
Seeking assistance	2
Legal context for this guide	2
1. Lighting product applications	3
1.1. Product criteria and documentation	3
1.2. Lighting upgrade product types	3
1.3. Project-based activity lighting applications	4
1.4. How to lodge a request to modify the register of products	4
1.5. Representing multiple products with a single test report	5
1.6. Can product approved for building based lighting also be submitted for public lighting upgrades and/or non-building-based lighting upgrades?	7
1.7. Performance and safety testing of approved lighting products	7
2. Product performance and documentation requirements	8
2.1. Summary of general requirements for all of Activity 21 products	8
2.2. Further details of general requirements applicable to all products under Activity 21	9
2.3. Additional requirements applicable for individual product category under schedule 21	13
2.4. Product categories 27, 34 and 35: General requirements - lighting upgrade	18
2.5. Product category 27: Public lighting upgrade products	20
2.6. Product category 34: Building based lighting upgrade products	25
2.7. Product category 35: Non-building based lighting upgrade products	31
Glossary	37
General definitions	37
Lighting-specific terms	38

Introduction

This guide provides product applicants with guidance on how to apply for lighting products to be listed on our Register of Products, so that they are eligible to be installed and create Victorian energy efficiency certificates (VEECs) under the Victorian Energy Upgrades (VEU) program.

About this guide

This guide provides product applicants with instructions and our documentation requirements for applying for a lighting product to be listed on our Register of Products.

The product categories covered by this guide are:

- Incandescent lighting products (product category 21)
- Public lighting upgrade products (product category 27)
- Building based lighting upgrade products (product category 34)
- Non-building based lighting activity products (product category 35)

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

You should also read our Application Guide for Product Applicants, which provides additional 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

- applying 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 must hold a VEU account to apply for a product listing. Find out more about creating a VEU account at www.esc.vic.gov.au/become-veu-accredited

Seeking assistance

If you encounter difficulties with your application that cannot be answered using this guide, contact us on (03) 9032 1310 or veu@esc.vic.gov.au

We appreciate the time and effort that businesses put into their applications and our product officers will endeavour to work with you during the assessment process.

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

View these documents at 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. Product criteria and documentation

Products must meet the specified requirements to be listed on the Register of Products and create VEECs. We do not accept deviations from the listed standards.

You must review and familiarise yourself with the product performance and documentation requirements for each type of product before testing products and submitting product applications.

If you are unable to provide sufficient and clear evidence that a product can meet the minimum criteria, the product will not be approved.

For most of the product categories listed on the following pages, you must 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.

Consult the relevant sections of the VEET Regulations and VEU specifications when preparing documentary evidence for your application.

1.2. 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 can be installed in public open spaces (roads and public outdoor spaces) owned by relevant bodies.

Traffic signal light replacement and sports field lighting upgrades are not eligible.

There are two main product categories under this activity:

- 'AEMO approved'
- 'ESC approved'.

You may submit products approved by AEMO to us to be included on our Register of Products in the 'AEMO approved' category. Alternatively, you can provide the documentation listed in Section 2 to 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 can only be installed in non-residential/business premises. Both lamps and lighting control devices are listed on our Register of Products.

Non building-based lighting upgrade (product category 35)

Non-building based lighting upgrade products are those installed in environments that are not included in public lighting upgrade (activity 27) or building based lighting upgrade (activity 34).

Eligible installation environments include outdoor spaces such as sports fields and parks.

1.3. Project-based activity lighting applications

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. How to lodge a request to modify the register of products

As noted in Section 3.2 of the Application Guide for Product Applicants, stakeholders can request modifications to, or removal of, approved products on the Register of Products by emailing the required information to us at veu@esc.vic.gov.au. For example, where we have estimated the NLP of a lighting product, we will update the estimate in the Register of Products upon request upon provision of a product specification sheet.

We may decide to modify the Register of Products as a result of a request if satisfied that the modification is consistent with program requirements.

1.5. Representing multiple products with a single test report

In some circumstances, you may submit one test report to represent several similar products. Unless explicitly stated, separate tests and approvals are required for each individual product, and each test report must identify the brand and model of the product to which it applies.

All supporting documentation must specify the product brand and model number. If different supporting documents contain different brands and/or model numbers, you 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.

When can I submit a representative test report for ISTMT tests?

We will accept a representative test report for an in-situ temperature measurement test (ISTMT) 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).

If the lamp has switchable colour temperatures, a representative result can only be accepted if:

- the lowest CCT has been tested
- two settings have the same circuit arrangement (number of chips number of parallel strings) and therefore the drive current per chip is the same
- all chips are of the same model and only differing in CCT
- the intermediate setting is the result of higher and lower circuits being run at the same time in parallel (meaning the drive current per chip will be half that of the tested setting)
- the constant current driver is providing the same fixed current for all settings

- the above can be confirmed by the laboratory in the ISTMT report and that therefore the tested setting is the worst case in terms of temperature.

Alternatively, all settings must be tested and reported.

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

- products with different LED chips
- 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.

When can I submit a representative test report for ingress protection tests?

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

When can I submit a representative test report for CISPR tests?

CISPR¹ 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, LED chips or circuitry will need to submit separate CISPR reports. Brand/model reconciliation documents are not accepted for CISPR reports.

¹ CISPR is the Comité International Spécial des Perturbations Radioélectriques. In English: International Special Committee on Radio Interference.

1.6. Can product approved for building based lighting also be submitted for public lighting upgrades and/or non-building based lighting upgrades?

Products listed as building based lighting upgrade products (product category 34) may also be approved as public lighting upgrade products (product category 27) and/or non-building based lighting upgrade products (product category 35).

To apply for listing in a second product category, you can lodge a new product application, with supporting documents, using the online product application tool.

1.7. Performance and safety testing of approved lighting products

We 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.

In addition to the annual performance and safety testing, we will also undertake in-house check testing to verify the performance of approved lighting products.

It is a condition of listing on the Register of Products that applicants submit products to us for testing upon request. 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 based on 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. Summary of general requirements for all of Activity 21 products

This table summarises all the general requirements for activity 21 products. '√' means the requirement is applicable to the activity. 'x' means the requirement is not applicable to the activity

Requirements	21A	21B	21C	21D	21E	21F
Minimum true power factor	√	√	√	√	√	√
Minimum CRI	√	√	√	√	√	√
Minimum light output	x	x	√	√	√	√
Omni directionality	√	x	x	x	x	x
Light source efficacy	√	√	√	√	√	√
CCT	√	√	√	√	√	√
Beam angle	x	x	√	√	√	√
Maximum premature LED chip failure rate	√	√	√	√	√	√
Lifetime	√	√	√	√	√	√
EMC	√	√	√	√	√	√
Safety	√	√	x	√	√	√
Dimmable	√	√	√	√	√	√
Ingress Protection	x	√	x	x	x	x
Transformer compatibility	x	x	√	x	x	x
ERAC registration	√	√	x	√	√	√

2.2. Further details of general requirements applicable to all products under Activity 21

The following table provides details of general requirements.

Requirements	Product criteria	Documentary evidence
Minimum true power factor	<ul style="list-style-type: none"> • ≥ 0.55 or ≥ 0.8 for high power factor multiplier • ≥ 0.55 or ≥ 0.9 for high power factor for 21B • The combined lamp circuit power factor² of the tested lamp and transformer must be ≥ 0.7 if the lamp is to be installed in residential premises or ≥ 0.9 if the lamp is to be installed in business or other non-residential premises. This is for 21C • ≥ 0.55 or $\geq 0.9$³ for high power factor multiplier for 21D • ≥ 0.55 or ≥ 0.9 for high power factor multiplier for 21E • ≥ 0.55 or ≥ 0.9 for high power factor for 21F 	<ul style="list-style-type: none"> • Test report: <ul style="list-style-type: none"> – using IES LM-79-08 or other methodology from a laboratory accredited by National Association of Testing Authorities (NATA) or equivalent body – 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 – Minimum test sample size: 10 units • Documentation showing the laboratory is accredited to perform IES LM-79-08 (if required).
Minimum CRI	Average ≥ 80 .	

² The test must be conducted with a transformer designed for a 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

³ 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

Minimum light ⁴ output	<ul style="list-style-type: none"> • 420 lumens(21C) • 400 lumens (21D, 21E and 21F)
CCT	A colour temperature that is, or can be set to, warm white (2700K to 3500K) or cool white (3500K to 4000K).
Minimum lighting source efficacy levels	<ul style="list-style-type: none"> • 84 lumens/watt for schedule 21A • 45 lumens/watt for schedule 21B • 52 lumens/watt for schedule 21C • 48 lumens/watt for schedule 21D, 21E and 21F
Dimmable	<p>If the lamp is to be installed in a dimmable circuit, is approved by the manufacturer as suitable for such a circuit.</p> <ul style="list-style-type: none"> • Manufacturer's declaration or product specifications (if required).
EMC	<p>Compliance with AS/NZS CISPR 15:2017.</p> <ul style="list-style-type: none"> • Test report: <ul style="list-style-type: none"> – using AS/NZS CISPR 15:2017 from a laboratory accredited by NATA or equivalent body – 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 • Documentation showing the laboratory is accredited to perform AS/NZS CISPR 15:2017. • Minimum test sample size: 5 units

⁴ This requirement does not apply to activity 21A or 21B. However, the installation requirement for 21A is that the upgrade light has a light output equivalent to or higher than the decommissioned lamp. The installation requirement for 21B is that the upgrade light has a light output equivalent to the decommissioned lamp.

Safety ⁵	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>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.</p>
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"> • 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. <ul style="list-style-type: none"> – Minimum test sample size: 10 units (20 units are recommended)
Lifetime	<ul style="list-style-type: none"> • L70 (70% of original lamp light output) at 8,000 hours for 21A • L70 (70% of original lamp light output) at 12,000 hours for 21B • L70 (70% of original lamp light output) at 15,000 hours for 21C, 21D, 21E and 21F. 	<ul style="list-style-type: none"> • IES LM-80-08 or ANSI/IES LM-80-15 test report <ul style="list-style-type: none"> – Produced from a laboratory accredited by NATA or equivalent body to perform IES LM-80-08 or ANSI/IES LM-80-15. – Minimum test sample size: 10 units (20 units are recommended) – must be conducted under minimum of two temperatures. One of the test conditions must be either 55°C or 85°C. – The test report containing TM21 projection information is preferred. If TM21 projection is not covered by the LM-80 report and if lifetime interpolation between LM80 temperatures is required, a separate TM21 report must be provided for the projection of lifetime. • IES TM-21-11 test report (this is required unless the TM21 data is reported in the LM80 report): <ul style="list-style-type: none"> – Produced by a laboratory accredited by NATA or equivalent body to perform IES LM-80-08 or ANSI/IES LM-80-15 – Based on the corresponding IES LM-80-08 or ANSI/IES LM-80-15 test report

⁵ The safety requirement does NOT apply to schedule 21C.

- Minimum test sample size: 10 units (20 units are recommended)
- **ISTMT (In-situ temperature measurement test) report**
 - Must be issued in the **exact brand and model** of each product applied for
 - Include statement that the ISTMT was conducted in accordance with Annex A of IES LM-84-14 (the laboratory **is not** required to be accredited to IES LM-84-14)
 - in accordance with 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 should be conducted at 230V (+10%/-6%), 50 Hz and ambient temperature at 25 °C (230V is preferred).
 - Minimum test sample size: 1 unit
 - the brand and model and forward current of the LED chip(s)
 - 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 total drive current of the Chip on Board (COB) array, the number of parallel LED arrays (strings), number of LED chips in an array, and average drive current of a LED array.
 - clear photos showing the original product label listing the exact brand and model of the product applied for and the exact position of the thermocouple.

Notes:

- We will accept a representative ISTMT test report (see Section 1.5) in the instances where differences between the models are not likely to influence the ISTMT result.

	<ul style="list-style-type: none"> – 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. 	<ul style="list-style-type: none"> • The tests must be conducted on the product with the highest drive current. If the drive currents are identical, the test must be conducted on the product with the lowest CCT. We require individual ISTMT tests for all other proposed products • 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. • Manufacturer’s declaration stating: <ul style="list-style-type: none"> – the brand and model of the LED chip supplied, and brand and model of lamp applied for – the forward current of the LED chip(s) used in each lamp when operating under normal Australian conditions. • Scope of accreditation documents for each testing laboratory.
ERAC registration	<ul style="list-style-type: none"> • All products except for the low voltage products proposed under 21C must be registered on ERAC database 	<ul style="list-style-type: none"> • Screenshot confirming the registration of the product with ERAC. The brand and model of the product must be clearly visible.

2.3. Additional requirements applicable for individual product category under schedule 21

This section lists additional requirements applicable for each individual product category which are not covered by the common requirements listed above.

2.3.1. Incandescent lighting (product category 21A: LED GLS lamp)

Requirements	product criteria	Documentary evidence
Omnidirectional requirement ⁶	<ul style="list-style-type: none"> 80% of the luminous intensity measured values (candelas) shall vary by no more than 35% from the average of all measured values in the 0° to 130° zone. All measured values (candelas) in the 0° to 130° zone shall vary by no more than 60% from the average of all measured values in that zone. No less than 5% of total flux (zonal lumens) shall be emitted in the 130° to 180° zone. 	<ul style="list-style-type: none"> Test report: <ul style="list-style-type: none"> using IES LM-79-08 from a laboratory accredited by NATA or equivalent body must include a calculation which demonstrates compliance against each of the Product Criteria must include a statement of compliance against each of the omnidirectionality criteria 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 Minimum test sample size: 10 units Documentation showing the laboratory is accredited to perform IES LM-79-08.

2.3.2. Product category 21B: LED lamp replacement of reflector

Requirement	Product criteria	Documentary evidence
Ingress protection (IP)	If the lamp is to be installed in an external environment, a minimum rating of IP44 is required	<ul style="list-style-type: none"> Test report <ul style="list-style-type: none"> 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.

⁶ Source: U.S. Environmental Protection Agency, ENERGY STAR program. *ENERGY STAR Program Requirements for Lamps - Eligibility Criteria Version 2.0 (Rev. February 2016)*

- 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.
- Minimum test sample size: 1 unit
- 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)

2.3.3. Product category 21C: 12V non-integrated LED lamp

Requirement	Product criteria	Documentary evidence
Beam angle	If the lamp is to be installed in residential premises, has a beam angle ≥ 55 degrees when determined in accordance with IEC/TR 61341 Edition 2.0.	<ul style="list-style-type: none"> • Test report: <ul style="list-style-type: none"> – using IEC/TR 61341 Edition 2.0 from a laboratory accredited by NATA or equivalent body (if required) – 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 • Documentation showing the laboratory is accredited to perform IEC/TR 61341 Edition 2.0, IES-LM79-08 or equivalent (if required).
Transformer compatibility	The non-integrated LED lamp must be compatible with the type of extra-low voltage lighting converter used with the decommissioned lamp	<ul style="list-style-type: none"> • Manufacturer's declaration or product specifications listing compatible transformers.

2.3.4. Product category 21D: Mains voltage downlight LED luminaire

Requirement	Product criteria	Documentary evidence
Beam angle	If the lamp is to be installed in residential premises, has a beam angle ≥ 40 degrees when determined in accordance with IEC/TR 61341 Edition 2.0.	<ul style="list-style-type: none"> • Test report: <ul style="list-style-type: none"> – using IEC/TR 61341 Edition 2.0 from a laboratory accredited by NATA or equivalent body (if required) – 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 • Documentation showing the laboratory is accredited to perform IEC/TR 61341 Edition 2.0, IES-LM79-08 or equivalent (if required).

2.3.5. Product category 21E: LED lamp with integrated driver and GU10 base

Requirement	Product criteria	Documentary evidence
Beam angle	If the lamp is to be installed in residential premises, has a beam angle ≥ 55 degrees when determined in accordance with IEC/TR 61341 Edition 2.0.	<ul style="list-style-type: none"> • Test report: <ul style="list-style-type: none"> – using IEC/TR 61341 Edition 2.0 from a laboratory accredited by NATA or equivalent body (if required) – 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 • Documentation showing the laboratory is accredited to perform IEC/TR 61341 Edition 2.0, IES-LM79-08 or equivalent (if required).
GU10 base	Must be an LED lamp with integrated driver and GU10 base	<ul style="list-style-type: none"> • Product specification sheet

2.3.6. Product category 21F: Mains voltage LED integrated downlight

Requirement	Product criteria	Documentary evidence
Beam angle	If the lamp is to be installed in residential premises, has a beam angle ≥ 55 degrees when determined in accordance with IEC/TR 61341 Edition 2.0.	<ul style="list-style-type: none"> • Test report: <ul style="list-style-type: none"> – using IEC/TR 61341 Edition 2.0 from a laboratory accredited by NATA or equivalent body (if required) – 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 • Documentation showing the laboratory is accredited to perform IEC/TR 61341 Edition 2.0, IES-LM79-08 or equivalent (if required).
Downlight fitting	The product must be a mains voltage downlight LED integrated luminaire.	<ul style="list-style-type: none"> • Product specification sheet

2.4. 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 (≥ 0.90)	Compatibility range	Voltage
T5, T8 or T12 fluorescent lamp only CFL (GLS)	Lamp /LCDs	Lamp ¹			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)	Lamp / control gear / luminaire / LCDs		Lamp & control gear	Lamp & control gear	Lamp	Lamp / control gear / luminaire	Lamp / control gear / luminaire			

LED downlight with integral driver (240V)										
LED ELV downlight with 240V remote driver										
LED other (240V)										
CFL lamp										
Induction lamp										
LED ELV downlight (lamp only)	Lamp		Lamp	Lamp & transformer	Lamp		Lamp	Lamp & transformer	Lamp ²	
VRU unit					Unit	Unit			Unit	Unit
LCD	Unit					Unit	Unit		Unit	

¹ 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.

² The installer must ensure compatibility of the lamp with the existing transformer.

2.5. Product category 27: Public lighting upgrade products

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

- AEMO-approved: When proposing an AEMO approved luminaire, please submit the brand, model, nominal lamp power, and a screenshot of the product listing in AEMO’s NEM Load Table⁷.
 - 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.
- 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.

Requirements	Product criteria	Documentary evidence
Safety & EMC	<ul style="list-style-type: none"> • Luminaire complies with AS/NZS 60598.1 and AS/NZS 60598.2.3 • Control gear complies with AS/NZS 61347.2.13 	<p>Safety certificates with Regulatory Compliance Mark (RCM) issued by a state government safety body or JAS-ANZ accredited approval provider.</p> <p>Safety Certificate for the control gear is not required if the product applied for has an integrated driver.</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>
Ingress protection (IP)	<ul style="list-style-type: none"> • Optical chamber is rated IP65 • Control gear chamber is rated IP65 (unless the 	<ul style="list-style-type: none"> • Test report: <ul style="list-style-type: none"> – 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)]

⁷ 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

Requirements	Product criteria	Documentary evidence
	control gear is rated IP65, then the control gear chamber can be rated IP24).	<ul style="list-style-type: none"> – Minimum test sample size: 1 unit – 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 • 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) • You may submit a representative test report (see Section 1.5) for several products if all the following criteria are met: <ul style="list-style-type: none"> – 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 – Statement from the laboratory must confirm that the results of the IP report apply to all models listed in the report – The safety certificate must list the model and corresponding IP rating for all proposed lamps.
Lamp circuit power (LCP)	N/A	<ul style="list-style-type: none"> • LM-79 Test report: <ul style="list-style-type: none"> – using IES LM-79-08 from a laboratory accredited by NATA or equivalent body – 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 – Minimum test sample size: 1 unit – Must be tested at 230V (+10%/-6%), 50 Hz • Corresponding IES photometric files • Documentation showing the laboratory is accredited to perform IES LM-79-08.
Power factor	Combined power factor of the lamp and control gear must be ≥ 0.90 .	
Lighting efficacy	100 lumens/watt.	
Correlated colour temperature (CCT)	2700K to 5700K for streetlights	
Colour rendering index (CRI)	≥ 70 .	
Nominal Lamp Power (NLP)	NLP is checked against the LCP to ensure NLP is not too low compared to the LCP	<ul style="list-style-type: none"> • Documentation showing the NLP value of the products applied for, including any of the following: <ul style="list-style-type: none"> – Product specification sheet – Manufacturer's declaration

Requirements	Product criteria	Documentary evidence
		<ul style="list-style-type: none"> - Product/packaging label - LCP test report
Lifetime	N/A	<ul style="list-style-type: none"> • IES LM-80-08 or ANSI/IES LM-80-15 test report <ul style="list-style-type: none"> - Produced from a laboratory accredited by NATA or equivalent body to perform IES LM-80-08 or ANSI/IES LM-80-15. - Minimum test sample size: 10 units (20 units are recommended) - must be conducted under minimum of two temperatures. One of the test conditions must be either 55°C or 85°C. - The test report containing TM21 projection information is preferred. If TM21 projection is not covered by the LM-80 report and if lifetime interpolation between LM80 temperatures is required, a separate TM21 report must be provided for the projection of lifetime. • IES TM-21-11 test report (required unless the TM21 data is reported in the LM80 report): <ul style="list-style-type: none"> - produced by a laboratory accredited by NATA or equivalent body to perform IES LM-80-08 or ANSI/IES LM-80-15 - based on the corresponding IES LM-80-08 or ANSI/IES LM-80-15 test report - Minimum test sample size: 10 unit (20 units are recommended) • ISTMT (In-situ temperature measurement test) report <ul style="list-style-type: none"> - must be issued in the <u>exact brand and model</u> of each product (Brand/model reconciliation documents are not accepted for ISTMT reports) applied for: - include statement confirming 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) - 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

Requirements	Product criteria	Documentary evidence
		<ul style="list-style-type: none"> - The ISTMT should be conducted at 230V (+10%/-6%), 50 Hz with the control gear supplied with the lamp (230V is preferred). - must be conducted at ambient temperature of 25°C. - 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 Chip on Board (COB) - the test sample size (minimum 1 unit) - the brand and model and forward current of the LED chip(s) - must include clear photos: <ul style="list-style-type: none"> o 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* o showing the exact position of the thermocouple. <p>Notes:</p> <ul style="list-style-type: none"> • We will accept a representative ISTMT test report (see Section 1.5) in the instances where differences between the models are not likely to influence the ISTMT result. <ul style="list-style-type: none"> - 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, the test must be conducted on the product with the lowest CCT. We require individual ISTMT tests for all other proposed products. • The ISTMT temperature and LED chip forward current of the tested product must be equal to or lower than the

Requirements	Product criteria	Documentary evidence
		<p>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.</p> <ul style="list-style-type: none"> • Manufacturer's declaration stating: <ul style="list-style-type: none"> – the brand and model of the LED chip supplied with each brand and model of lamp applied for, and – the forward current of the LED chip(s) used in each lamp when operating under normal Australian conditions. • Scope of accreditation document for each testing laboratory.
Specifications	N/A	Product specification sheet showing the specifications of the product, including (where relevant), nominal lamp power, the LCDs contained in the luminaire and information on whether the driver is integrated.

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

Requirements	Product criteria	Documentary evidence
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>
Ingress protection (IP)	Rated IP65	<ul style="list-style-type: none"> • Test report: <ul style="list-style-type: none"> – 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 – 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 – Minimum test sample size: 1 unit • 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)

Requirements	Product criteria	Documentary evidence
		<ul style="list-style-type: none"> You may submit a representative test report (see Section 1.5) for several products if all the following criteria are met: <ul style="list-style-type: none"> 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 Statement from the laboratory must confirm that the results of the IP report apply to all models listed in the report The safety certificate must list the model and corresponding IP rating for all proposed LCDs.
Specifications	N/A	Product specification sheet showing the specifications of the product, showing functionality of the product

2.6. Product category 34: Building based lighting upgrade products

Requirements	Product type	Documentary evidence
Specifications	All	<ul style="list-style-type: none"> Product specification sheet showing the specifications of the product, including (where relevant), type and specifications of LCDs built into to lamps All lamp specifications must show an NLP value for each proposed luminaire. Information on whether the products have integrated driver or external driver
MEPS	<ul style="list-style-type: none"> T5, T8, or T12 fluorescent lamp CFL (GLS) 	Screen shot of MEPS registration details from www.energyrating.gov.au .
LCP	<ul style="list-style-type: none"> LED highbay LED tube (lamp only) LED tube (luminaire) LED downlight with integral driver (240V) 	<ul style="list-style-type: none"> Test report <ul style="list-style-type: none"> produced from laboratory accredited by NATA or equivalent body showing the combined lamp circuit power (LCP) of the lamp and control gear (in watts) Must be tested at 230V (+10%/-6%), 50 Hz

Requirements	Product type	Documentary evidence
	<ul style="list-style-type: none"> LED ELV downlight with 240V remote driver LED other (240V) CFL downlight induction fluorescent lamp 	<ul style="list-style-type: none"> – must be conducted with the lamp and control gear the product will be supplied and installed with – The LCP may be reported as a part of the ISTMT test report • If the safety certificate provided is for the control gear only, the LCP report must either: <ul style="list-style-type: none"> – state the exact brand and model number of the control gear tested with the lamp. – provide 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.
	LED ELV downlight (lamp only)	<ul style="list-style-type: none"> • Test report <ul style="list-style-type: none"> – produced from laboratory accredited by NATA or equivalent body showing the lamp circuit power (LCP) of the lamp and a transformer (in watts) – should be tested at 230V (+10%/-6%) (230V is preferred), 50 Hz – may be reported as a part of the ISTMT test report – the lamp must be tested with a representative magnetic or electronic transformer designed for halogen lamps – the lamp will only be approved for installation with the same type of transformer (magnetic or electronic) that it was tested with. – 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.
NLP	<ul style="list-style-type: none"> T5, T8, or T12 fluorescent lamp CFL (GLS) 	<ul style="list-style-type: none"> • Screenshot of MEPS registration details from www.energyrating.gov.au, • Manufacturer's product specification sheet or declaration

Requirements	Product type	Documentary evidence
	<ul style="list-style-type: none"> • Metal halide • Mercury vapour • High pressure sodium • 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) • CFL downlight • induction • fluorescent lamp • LED ELV downlight (lamp only) 	<ul style="list-style-type: none"> • Manufacturer's product specification sheet or declaration • Product/packaging label • 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.
Lifetime	Non-LEDs	<ul style="list-style-type: none"> • Manufacturer's product specification sheet or declaration • 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.
	LEDs	<ul style="list-style-type: none"> • IES LM-80-08 or ANSI/IES LM-80-15 test report <ul style="list-style-type: none"> – produced from a laboratory accredited by NATA or equivalent body to perform IES LM-80-08 or ANSI/IES LM-80-15. – Minimum test sample size: 10 units (20 units are recommended)

Requirements	Product type	Documentary evidence
		<ul style="list-style-type: none"> – must be conducted under minimum of two temperatures. One of the test conditions must be either 55°C or 85°C. – The test report containing TM21 projection information is preferred. If TM21 projection is not covered by the LM-80 report and if lifetime interpolation between LM80 temperatures is required, a separate TM21 report must be provided for the projection of lifetime. • IES TM-21-11 test report (required unless the TM21 information is reported in the LM 80 report): <ul style="list-style-type: none"> – produced by a laboratory accredited by NATA or equivalent body to perform IES LM-80-08 or ANSI/IES LM-80-15 – based on the corresponding IES LM-80-08 or ANSI/IES LM-80-15 test report – Minimum test sample size: 10 units (20 units are recommended) • ISTMT report <ul style="list-style-type: none"> – must be issued in the <u>exact brand and model</u> of each product applied for (Brand/model reconciliation documents are not accepted for ISTMT reports) – include a statement confirming 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) – 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 should be conducted at 230V (+10%/-6%) (230V is preferred), 50 Hz with the control gear supplied with the lamp. – the ISTMT must be conducted at ambient temperature of 25°C.

Requirements	Product type	Documentary evidence
		<ul style="list-style-type: none"> – the test sample size (minimum 1 unit) – 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 Chip on Board (COB) – the brand and model and forward current of the LED chip(s) – must include clear photos: <ul style="list-style-type: none"> ○ 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* ○ showing the exact position of the thermocouple. <p>Notes:</p> <ul style="list-style-type: none"> • We will accept a representative ISTMT test report (see Section 1.5) 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. • 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-

Requirements	Product type	Documentary evidence
		<p>80-15 report or the lifetime of the product cannot be established.</p> <ul style="list-style-type: none"> • Manufacturer’s declaration stating: <ul style="list-style-type: none"> – the brand and model of the LED chip supplied with each brand and model of lamp applied for – the forward current of the LED chip(s) used in each lamp when operating under normal Australian conditions. • Scope of accreditation document for each testing laboratory.
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>Alternatively, 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"> • 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); or • Screen shot of product registration details on the national equipment registration system database https://equipment.erac.gov.au/Registration/; or • Regulatory Compliance Mark (RCM) certificate of approval; or • 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 LED ELV downlights – lamp only). We may request further supporting documentation as required.

Requirements	Product type	Documentary evidence
Power factor (≥ 0.90)	LED ELV downlight (lamp only)	<ul style="list-style-type: none"> • Test report from laboratory accredited by NATA or equivalent body showing the combined power factor of the lamp and a transformer • The power factor must be tested at 230V (+10%/-6%), 50 Hz • When applicable the lamp must be tested with a representative magnetic or electronic transformer designed for halogen lamps • The lamp will only be approved for installation with the same type of transformer (magnetic or electronic) that it was tested with • 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.
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.
Voltage	VRU	<ul style="list-style-type: none"> • Test report from a laboratory accredited by NATA or equivalent body showing the output voltage of the VRU • 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
LCD type	LCD	<ul style="list-style-type: none"> • Product specification sheet showing type and functionality of the LCD

2.7. Product category 35: Non-building based lighting upgrade products

The table 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 1.6.

Requirements	Product criteria	Documentary evidence
Safety & EMC	<ul style="list-style-type: none"> Luminaire complies with AS/NZS 60598.1 and AS/NZS 60598.2.5 Control gear complies with AS/NZS 61347.2.13. 	<p>Safety certificates with Regulatory Compliance Mark (RCM) issued by a state government safety body or JAS-ANZ accredited approval provider.</p> <p>Safety certificates for the control gear are not required if the product applied for has integrated driver.</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>
Ingress protection (IP)	<ul style="list-style-type: none"> Optical chamber is rated IP65 Control gear chamber is rated IP65 (unless the control gear is rated IP65, then the control gear chamber can be rated IP24). 	<ul style="list-style-type: none"> Test report <ul style="list-style-type: none"> 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)] Minimum test sample size: 1 unit 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 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) You may submit a representative test report (see Section 1.4) for several products if all the following criteria are met: <ul style="list-style-type: none"> 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 statement from the laboratory must confirm that the results of the IP report apply to all models listed in the report the safety certificate must list the model and corresponding IP rating for all proposed lamps.
Suitability for outdoor environments	<ul style="list-style-type: none"> Luminaire complies with specific clauses of AS/NZS 60598.2.5 	<ul style="list-style-type: none"> Safety test report <ul style="list-style-type: none"> showing compliance to all aspects of Clause 5.6.5 of AS/NZS 60598.2.5 Minimum test sample size: 1 unit

Requirements	Product criteria	Documentary evidence
	relevant to luminaires for use outdoors above ground level.	<ul style="list-style-type: none"> – 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 • Documentation showing the laboratory is accredited to perform AS/NZS 60598.2.5 • You may submit a representative test report for several products from the same family, if the following criteria are met: <ul style="list-style-type: none"> – A safety test report with test standard AS/NZS 60598.2.5 can be submitted for a product with the highest wattage (worst case) – Statement from the laboratory confirming that safety report applies to all other models – Safety certificate must list all proposed lamps on the same certificate.
Lamp circuit power (LCP)	N/A	<ul style="list-style-type: none"> • Test report <ul style="list-style-type: none"> – using IES LM-79-08 from a laboratory accredited by NATA or equivalent body – Minimum test sample size: 1 unit – Must be tested at 230V (+10%/-6%), 50 Hz – 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 • Corresponding IES photometric files • Documentation showing the laboratory is accredited to perform IES LM-79-08.
Power factor	Combined power factor of the lamp and control gear must be ≥ 0.90	
Lighting efficacy	100 lumens/watt	
Colour rendering index (CRI)	≥ 70	
Nominal Lamp Power (NLP)	NLP is checked against the LCP to ensure NLP is not too low compared to the LCP	<ul style="list-style-type: none"> • Documentation showing the NLP value of the products applied for, including any of the following: <ul style="list-style-type: none"> – Product specification sheet – Manufacturer’s declaration – Product/packaging label –

Requirements	Product criteria	Documentary evidence
Lifetime	Reported lifetime (L ₇₀) should be provided	<ul style="list-style-type: none"> • IES LM-80-08 or ANSI/IES LM-80-15 test report <ul style="list-style-type: none"> – produced from a laboratory accredited by NATA or equivalent body to perform IES LM-80-08 or ANSI/IES LM-80-15. – Minimum test sample size: 10 units (20 units are recommended) – must be conducted under minimum of two temperatures. One of the test conditions must be either 55°C or 85°C. – The test report containing TM21 projection information is preferred. If TM21 projection is not covered by the LM-80 report and if lifetime interpolation between LM80 temperatures is required, a separate TM21 report must be provided for the projection of lifetime • IES TM-21-11 test report (required unless the TM21 information is reported in the LM80 report): <ul style="list-style-type: none"> – produced by a laboratory accredited by NATA or equivalent body to perform IES LM-80-08 or ANSI/IES LM-80-15 – based on the corresponding IES LM-80-08 or ANSI/IES LM-80-15 test report – IES LM-80-08 or ANSI/IES LM-80-15 reports that contain a TM-21-11 calculation are acceptable. – Minimum test sample size: 10 units (20 units are recommended) • The ISTMT report <ul style="list-style-type: none"> – must be issued in the <u>exact brand and model</u> of each product (Brand/model reconciliation documents are not accepted for ISTMT reports) applied for – include a statement confirming that the ISTMT was conducted in accordance with Annex A of IES LM-84-14 (the laboratory is not required to be accredited to IES LM-84-14), – 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

Requirements	Product criteria	Documentary evidence
		<ul style="list-style-type: none"> - the ISTMT must be conducted at 230V (+10%/-6%), 50 Hz with the control gear supplied with the lamp. - the ISTMT must be conducted at ambient temperature of 25°C. - the test sample size (minimum 1 unit) - the brand and model and forward current of the LED chip(s) - 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 Chip on Board (COB). • The ISTMT report <ul style="list-style-type: none"> - must include clear photos: <ul style="list-style-type: none"> ○ 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 ○ showing the exact position of the thermocouple. <p>Notes:</p> <ul style="list-style-type: none"> • We will accept a representative ISTMT test report (see Section 1.5) 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. • 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

Requirements	Product criteria	Documentary evidence
		<p>IES LM-80-08 or ANSI/IES LM-80-15 report or the lifetime of the product cannot be established.</p> <ul style="list-style-type: none"> • Manufacturer’s declaration stating: <ul style="list-style-type: none"> – the brand and model of the LED chip supplied with each brand and model of lamp applied for – the forward current of the LED chip(s) used in each lamp when operating under normal Australian conditions. • Scope of accreditation document for each testing laboratory.
Specifications	N/A	Product specification sheet showing the specifications of the product, including NLP, type of the driver (integrated or external) and types of LCDs (if any)

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.
DNISP	Distribution network service provider
EMC	Electromagnetic compatibility
Equivalent body	A testing body recognised by NATA under a mutual recognition agreement.
ERAC	Electrical Regulatory Authorities Council
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 ₂ -e) abated by the prescribed activity.

Lighting-specific terms

Term	Definition
CCT	Correlated colour temperature
COB	Chip on board
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.
Exact efficacy	Refers to the average value of efficacy based on test results of ten samples
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 an electronic step-down converter used with ELV lamps, which, <ul style="list-style-type: none"> receives an input from mains supply has single ELV (extra low voltage) output (either ac or dc) is sold with, or intended to be used with, ELV lamps(s) that constitute the primary load
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

Term	Definition
Downlight	A luminaire mounted flush with a surface, with a light source aperture whose largest dimension is less than 20 centimeters
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"> • all parts necessary for supporting, fixing and protecting the product and for connecting the product to the electricity supply • any lighting control device for the product
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 VEET 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;
Reported lifetime (L70)	Refers to L ₇₀ which is the projected operating time to 70% of lumen maintenance reported in LM80 report or TM21 report.

Document version control

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

Version	Amendments made	Date published
1.0	First release	10 December 2018
1.1	<ul style="list-style-type: none"> • Updated photograph requirements for test reports to mandatory regardless of issue date • Updated requirement on determination of drive current of LED chip in ISTMT reports to mandatory regardless of issue date • Updated requirement for statement of compliance against omni-directionality criteria • Updated sample size requirement for LM80 and TM21 reports • Updated NLP requirements • Added evidence for the new NLP requirement • Added requirement for providing information on driver type in specification sheet for product categories 27, 34 and 35. • Added requirement for product category 21 to require ERAC registration • Added definitions for “Exact efficacy” and “Reported lifetime(L70)” • Removed requirement for safety certificate for the driver where the product has integrated driver • Consolidated all the requirements for product categories 21A, 21B, 21C, 21D, 21E and 21F. 	1 October 2019
1.2	<ul style="list-style-type: none"> • Updated the requirements for a TM21 test report to require a separate TM 21 report if TM21 results are missing from the LM80 report • Introduced ISTMT test requirements for lamps with switchable colour temperatures (CCTs) • Clarified the test requirements related to the LM 80 test – more guidance provided on test temperatures • Minor edits to NLP requirement for Product Category 27,34 and 35 	20 February 2020