

CONSTRUCTION INDUSTRY COUNCIL

CIC GREEN PRODUCT CERTIFICATION

Assessment Standard

Technical Requirements

LED Lighting



CIC GREEN
PRODUCT CERTIFICATION

(Version 2)

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LED LIGHTING

Summary of Assessment Criteria

CORE CRITERIA

Criteria	Requirements	Verification	Points		Index
			Basic	+Bonus	
Product Information	Provide following information with delivered products or be made accessible to public: <ul style="list-style-type: none"> Country of origin Basic product specifications Installation method Instructions for consumer product disposal Operation & Maintenance Manual 	Documentation including, but not limited to, product catalogue, technical datasheet, and webpages	5	-	4.1.1
PERFORMANCE					
Efficiency Metrics	Luminous Efficacy: Requirements of luminous efficacy as listed in Table 2 of section 4.5.2.1	Documentation including, but not limited to product catalogues, technical datasheet, test reports	10	+5 / +10 / +15	4.5.1.2
	Power Factor: Meet the minimum allowable power factor for LED lamp / luminaire as referenced in Table 3 of Section 4.5.1.3	Documentation including, but not limited to product catalogues, technical datasheet, test reports	10	-	4.5.1.3
Lighting Quality	Correlated Colour Temperature: Product shall fulfil the correlated colour temperature as shown in Table 4 of Section 4.5.2.1.	Documentation including, but not limited to product catalogues, technical datasheet, test reports	10	-	4.5.2.1
	Colour Rendering Index (CRI): Fulfil the minimum requirement on the measured initial CRI as listed in Table 5 in Section 4.5.2.2 AND The measured CRI value shall not lower than 3 from the rated General CRI value declared by the applicant in the product specifications.	Documentation including, but not limited to product catalogues, technical datasheet, test reports	5	+5	4.5.2.2

Criteria	Requirements	Verification	Points		Index
			Basic	+Bonus	
Product Life	Lifespan for LED Lamp: LEDs shall deliver required life span for different LED Lamp Types, as listed in Table 6 of Section 4.5.3.1.	Laboratory test report(s) and guarantee certificate(s)	10	+5 / +10	4.5.3.1
		Subtotal:	50	+30	

NON-CORE CRITERIA

Criteria	Requirements	Verification	Points	Index
			+Bonus	
CARBON				
CFP Quantification	Provide a 3 rd party endorsed life cycle assessment report with the carbon footprint of products (CFP), covering at least A1 to A3 OR a product level Environmental Product Declaration (EPD).	CFP quantification report OR Environmental Product Declaration (EPD)	+10	4.2.1
RESOURCE				
Circularity	Recyclability: Developed a recycling plan for the product and declared options for reuse, recycling, recovery, and disposal.	Recycling plan	+5	4.3.1.1
	Packaging Requirement: The packaging materials shall not contain halogenated plastics; <i>OR</i> Shall be comprised of 100% recycled materials, readily recyclable materials or decomposable materials; <i>OR</i> Shall not be impregnated, labelled, coated, or otherwise treated in a manner which would prevent or significantly limit recycling.	Documentation on packaging materials used	+5	4.3.1.2
Waste Management	Waste Management Plan: Implement effective waste management plan detailing the policies, procedures, and/or a waste management program covering manufacturing operations.	Waste management plan	+5	4.3.2.1
Water Management	Option A: Water Consumption Reporting: Report both potable and non-potable water usage in the production process of the past year.	Water consumption report	+5/ +10	4.3.3.1
	Water Recycling Program: Develop and implement water recycling program during the manufacturing process.	Documentation on water recycling		4.3.3.2
	Option B: Water Management System: Process valid certificate under ISO 14046: Water Footprint Assessment.	ISO 14046 Certificate issued by accredited certification body		4.3.3.3
Energy Management	Option A: Energy Management Plan: Implement effective energy management policies and procedures and/or an energy management programme.	Energy management plan	+5/ +10	4.3.4.1

Criteria	Requirements	Verification	Points	Index
			+Bonus	
	Option B: Energy Management System: Possess valid certificate under ISO 50001: Energy management systems.	ISO 50001 Certificate issued by accredited certification body		4.3.4.2
ENVIRONMENT				
Environmental Management	Environmental Management System: Manufacturer shall possess valid certification of ISO 14001: Environmental management systems or EU Eco-Management and Audit Scheme (EMAS).	ISO 14001 or EMAS Certificate issued by accredited certification body	+5	4.4.1.1
Regional Product	Regional Manufactured Equipment: Products that are manufacturer within an 800km radius of HKSAR by road transportation; within a 1,600km radius by rail transportation; or within a 4,000km radius by sea transportation.	Location map with distance between manufacturer and HKSAR	+5	4.4.2.1
Human Toxicity and Ecosystem Impact	Hazardous Substances: The listed substances shall be less than 0.1% (by weight of the product) present in the final product: <ul style="list-style-type: none"> • Lead, mercury and hexavalent chromium • Polybrominated biphenyl (PBB) and polybrominated diphenyl ether (PBDE) • Bis(2-Ethylhexyl) phthalate (DEHP) • Benzyl butyl phthalate (BBP) • Dibutyl phthalate (DBP) • Diisobutyl phthalate (DIBP) <p>AND</p> Cadmium (Cd) shall be less than 0.01% (by weight of the product) present in the final product.	Laboratory test report(s) or self-declaration letter	+5	4.4.3.1
PERFORMANCE				
Efficiency Metrics	Energy Efficiency: LED lamp should achieve Grade 2 or above under MEELS from EMSD; <i>OR</i> Comply with international power consumption standards such as Energy Star.	Valid certificate from MEELS, Energy Star, or other equivalent certification	+5	4.5.1.1
Product Life	Lifespan for Switch: Shall withstand a minimum of on/off cycle in units of hours in Table 6 of Section 4.5.3.2.	Laboratory test report(s) or guarantee certificate(s)	+5	4.5.3.2
	Warranty: Provide warranty for at least a year from the date of purchase.	Guarantee certificate(s)	+5	4.5.3.3

Criteria	Requirements	Verification	Points	Index
			+Bonus	
INNOSMART				
Innovations & Additions	Achieving significant, measurable environmental performance using new practices, technology, and strategy not addressed in this Standard OR Incorporating various smart technologies to improve efficiency, reduce energy consumption, and optimize performance.	Narrative with supporting documents	+5	4.6.1
		Subtotal:	+80	

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1. INTRODUCTION

1.1 PURPOSE

The CIC Green Product Certification (the “Scheme”) is a green product labelling scheme, owned by the Construction Industry Council (CIC) and implemented by the Hong Kong Green Building Council (HKGBC). The primary goal of the scheme is to support Hong Kong’s transition to a low-carbon economy by encouraging the adoption of environmentally friendly construction practices.

With the Green Product Certification, various stakeholders, including consumers, building professionals, construction practitioners, and policymakers, can easily and unequivocally identify environmentally preferable construction materials and building products. This certification serves as a reliable indicator of a product’s sustainability, helping to drive market demand for greener options.

To ensure the credibility and effectiveness of the certification, the CIC and the HKGBC has jointly developed this Technical Assessment Standards (the “Standard”), which sets out the assessment criteria and their benchmarks to govern the application and award of a grade under the Scheme. The comprehensive assessment evaluates the overall sustainability of construction materials and building products across multiple dimensions. These dimensions include environmental impact, resource efficiency, technical performance, and the use of smart manufacturing technologies.

The Standard is divided into two main parts:

- General Requirements (Refer to General Requirements provided in separate document). This part introduces Scheme's framework, outlines the application procedure, and details the grades.
- Technical Requirements (This document refers). This part defines the principles, requirements and guides for quantifying and reporting the products’ carbon footprint (CFP), along with other sustainability assessment criteria and scoring standards.

This Standard neither modifies nor supersedes laws and regulations. Compliance with this Standard is not a substitute for, and does not assure, compliance with any applicable laws or regulations. Compliance with all applicable laws and regulations is a prerequisite for the manufacturing and marketing of the product.

The Scheme is owned by the Construction Industry Council (CIC), 38/F, COS Centre, 56 Tsun Yip Street, Kwun Tong, Kowloon, Hong Kong; and operated by Hong Kong Green Building Council (HKGBC), 1/F, Jockey Club Environmental Building, 77 Tat Chee Avenue, Kowloon Tong, Hong Kong, Phone: +852 3994 8888, Email: cicgpc@hkgbc.org.hk.

1.2 BACKGROUND

With the dramatic improvement in the performance and significant cost reduction of light emitting diodes (LEDs), they are increasingly accepted by users as an alternative to traditional light sources in a variety of lighting applications. LEDs are energy efficient and mercury-free, but like other electronic products, they could have some negative environmental impacts.

The purposes of the assessment criteria developed for LED lighting are, therefore, to minimise the use and subsequent release of environmentally harmful substances to the environment throughout the product's life cycle, to conserve energy consumption, and to encourage recycling and responsible disposal.

2. SCOPE

The scope of this Standard is applicable to both directional and non-directional LEDs used for general illumination purposes in all types of buildings. However, LED lamps producing tinted or coloured light as well as organic LED (OLED) lamps are excluded from this Standard.

Note:

ONE application is only eligible for **ONE** product series. All the related products have to be listed on the submitted documents. Each application should specify the product code / serial number.

3. DEFINITIONS

<i>Applicant:</i>	Organisations which apply for the label of the CIC Green Product Certification of the Construction Industry Council
<i>ANSI:</i>	American National Standards Institute
<i>CIC:</i>	Construction Industry Council
<i>CNAS:</i>	China National Accreditation Service for Conformity Assessment
<i>Colour rendering index (CRI):</i>	An index which is defined in terms of a comparison of the spectral tri-stimulus values of the objects under test illumination and standard illumination
<i>Directional lamp:</i>	A lamp having at least 80% of light output within a solid angle of π sr (corresponding to a cone with angle of 120 degrees)
<i>Non-directional lamp:</i>	A lamp having less than 80% of light output within a solid angle of π sr (corresponding to a cone with angle of 120 degrees)
<i>HKAS:</i>	Hong Kong Accreditation Service
<i>HKGBC:</i>	The Hong Kong Green Building Council Limited

<i>HOKLAS:</i>	The Hong Kong Laboratory Accreditation Scheme
<i>ISO:</i>	International Organization for Standardization
<i>LED:</i>	A P-N junction semiconductor device that emits incoherent optical radiation when biased in the forward direction. The output is a function of its physical construction, materials used, and exciting current and may be in the ultraviolet, visible, or infrared regions of the spectrum
<i>Non self-ballasted LED Lamp:</i>	LED lamp which needs a separate control gear (ballast) to operate
<i>Self-ballasted LED Lamp:</i>	LED lamp, incorporating control gear (ballast), and any additional elements necessary for stable operation of the light source, designed for direct connection to the supply voltage
<i>LED Luminaire:</i>	Luminaire designed to incorporate one or more LED light source(s) and any additional elements necessary for starting a stable operation of the light source
<i>Lumen maintenance:</i>	Luminous flux at a given time in the life of the LED expressed as a percentage of the initial luminous flux
<i>Luminous efficacy:</i>	A ratio of luminous flux emitted by a lamp to the electrical power consumed by the lamp (in watts, W)
<i>MEELS:</i>	Mandatory Energy Efficiency Labelling Scheme. Energy labels are required to be shown on the prescribed products for supply in Hong Kong to inform consumers of their energy efficiency performance
<i>MSDS:</i>	Material safety data sheet. To qualify as suitable, MSDS and information therein must not be more than 5-years old
<i>Power factor (PF):</i>	A ratio between real power and apparent power
<i>PAS:</i>	Publicly Available Specifications
<i>VEELS:</i>	The Hong Kong Voluntary Energy Efficiency Labelling Scheme
<i>Third-party:</i>	An entity without any financial interest or stake in the sales of the product or service being evaluated or other conflict of interest

4. EVALUATION CRITERIA

A product to be assessed shall meet all the minimum requirements of the “Core Criteria” in order to be awarded a “Green” (i.e. a “pass” grade) grade under the Scheme. Bonus points may be awarded if the product meets the “Non-core Criteria” and a “Bronze”, “Silver”, “Gold”, or “Platinum” grade will be awarded according to the total points accumulated, as shown in Table 1.

Table 1: Benchmarks for grading

Points achieved	Grade to be awarded
90 or above	Platinum
80 – 89	Gold
70 – 79	Silver
60 – 69	Bronze
50 – 59	Green
Below 50	No grade

All submissions and documentations shall be endorsed by the Chief Executive Officer or other authorised persons of the Applicant to demonstrate conformance to the assessment criteria. All certification, laboratory reports, and documentation must be valid during the assessment process and labelling period. The date of issue of all laboratory reports and documentation shall be within 5 years from the first application submission date.

If the certification expires during the labelling period or upon renewal, the applicant is required to provide an updated and valid certification. Failure to resubmit the required certification will result in the revocation of CIC Green Product Certificate without compensation.

The chemical tests should be conducted by either a third party or the manufacturer, providing that they have obtained ISO 17025 certification or relevant national accreditations, such as HOKLAS or CNAS.

4.1 BASIC INFORMATION

4.1.1 *Product Information – Core Criteria*

The Applicant is required to achieve 5 Basic Points under this section.

Requirements

5 Basic Points for providing following information with delivered products or made accessible to public:

- Country of origin
- Basic product specifications
- Installation method
- Instructions for consumer product disposal
- Operation & Maintenance Manual

Verification

Documentation showing the product information and instructions, including, but not limited to, product catalogue, technical datasheet, webpages, and/or any other information freely accessible by customers.

4.2 CARBON

4.2.1 *CFP Quantification - Non-core Criteria*

The Applicant can achieve maximum 10 Bonus Points under this section.

Requirements

10 Bonus Points for providing life cycle assessment report for quantifying and reporting the carbon footprint of products (CFP), covering at least A1 (raw material supply), A2 (transport), and A3 (manufacturing process). This can be achieved by either of the following:

Conduct CFP study report in accordance with ISO 14067:2018, GB/T 24067-2024, CIBSE TM 65 or equivalent.

OR

10 Bonus Points for providing the product's CFP value from a product level EPD issued in accordance with ISO 14067:2018, ISO 21930:2017, GB/T 24067-2024, GB/T 24025-2009 or BS EN 15804:2012.

Verification

CFP quantification report or Environmental Product Declaration endorsed by a third-party fulfilling the above requirements.

4.3 RESOURCE

4.3.1 *Circularity*

The Applicant can achieve maximum 10 Bonus Points under this section.

4.3.1.1 *Recyclability – Non-core Criteria*

Requirements

5 Bonus Points for demonstrating that the manufacturer has developed a recycling plan for the product and declared options for reuse, recycling, recovery, and disposal. The plan shall include the following and be made available to the public:

- Designate all homogeneous materials in the product as being intended for technical and/or biological cycles and define the intended cycling pathway(s) for each material; and
- Identify potential partners for product reuse, recycling, and recovery in accordance with the intended cycling pathway(s); and
- For products and materials intended for municipal recycling, the product and/or material must be compatible for municipal cycling systems (e.g., painted plastics and plastic laminated paper are not currently compatible for municipal recycling); and
- Instructions for how to cycle the product shall be made publicly available.

Verification

Documentation of recycling plan, including, but not limited to product catalogue, MSDS, and written declaration.

4.3.1.2 *Packaging Requirement – Non-core Criteria*

Requirements

5 Bonus Points for minimizing the wastage from all primary packaging materials. The packaging materials shall achieve either of the following:

The packaging materials shall not contain halogenated plastics

OR

The packaging materials shall be comprised of 100% recycled materials, readily recyclable materials, or decomposable materials

OR

The packaging shall not be impregnated, labelled, coated, or otherwise treated in a manner which would prevent or significantly limit recycling.

Verification

Documentation describing the packaging materials used as well as their chemical composition (if any and where applicable), treatment process, and recyclability.

4.3.2 Waste Management

The Applicant can achieve maximum 5 Bonus Points under this section.

4.3.2.1 Waste Management Plan – Non-core Criteria

Requirements

5 Bonus Points for implementing an effective waste management plan detailing the policies, procedures, and/or a waste management program covering manufacturing operations. The waste management plan should include, but should not be limited to, the following information:

- Initiatives taken to reduce waste generation and improve recovery/recycling of waste; and
- Initiatives implemented for recovery of post-consumer and/or pre-consumer waste that can be re-introduced into the manufacturing process; and
- Other environmental benefits or constraints associated with waste minimisation objectives and processes.

Verification

Documentation of waste management plan detailing the above, supported by organizational policy or other equivalent documents.

4.3.3 Water Management

The Applicant can achieve maximum 10 Bonus Points under this section.

The Applicants can select one of the options below and comply with any or all the requirements under that option to achieve associated points..

Option A:

4.3.3.1 Water Consumption Reporting – Non-core Criteria

Requirements

5 Bonus Points for reporting both potable and non-potable water usage in the production process of the past year.

Verification

Water consumption report, supported by water usage data acquired from water meter, water sub-meter, water bill, or other equivalent documents.

4.3.3.2 Water Recycling Program – Non-core Criteria

Requirements

5 Bonus Points for developing and implementing a water recycling program during the manufacturing process.

Verification

Documentation demonstrating the implementation of water recycling program, supported by drawings, water usage data acquired from water sub-meter, or other equivalent documents.

Option B:

4.3.3.3 Water Management System – Non-core Criteria

Requirements

10 Bonus Points for possessing valid certificate under ISO 14046: Environmental management – Water footprint – Principles, requirements and guidelines.

ISO 14046 is a framework for assessing the water footprint of products, processes, and organizations. It provides principles, requirements, and guidelines for conducting and reporting water footprint assessments. It helps organizations evaluate and improve their water management practices.

Verification

A valid ISO 14046 certificate issued by accredited certification body.

4.3.4 Energy Management

The Applicant can achieve maximum 10 Bonus Points under this section.

The Applicants can select one of the options below and comply with any or all the requirements under that option to achieve associated points.

Option A:

4.3.4.1 Energy Management Plan – Non-core Criteria

Requirements

5 Bonus Points for implementing effective energy management policies and procedures and/or an energy management programme, including, but not limited to, the following items:

- Energy efficiency initiatives: Manufacturer should undertake specific initiatives to reduce energy use and improve energy efficiency throughout their operations. This could include upgrading to more efficient equipment, optimizing production processes, or implementing energy-saving technologies; and

- Supplier requirements: Manufacturers should extend their energy management efforts to their supply chain by establishing requirements or initiatives for suppliers and contract manufacturers to improve their energy performance where possible.

Verification

Documentation of energy management plan detailing the above, supported by organizational policy or other equivalent documents.

Option B:

4.3.4.2 Energy Management System – Non-core Criteria

Requirements

10 Bonus Points for possessing valid certificates under ISO 50001: Energy management systems — Requirements with guidance for use.

ISO 50001 provides a framework for organizations to establish, implement, maintain, and improve an Energy Management System. The goal is to help organizations improve their energy performance, increase energy efficiency, and reduce energy costs and greenhouse gas emissions. By achieving ISO 50001 certification, manufacturers can demonstrate their commitment to energy efficiency and sustainability.

Verification

A valid ISO 50001 certificate issued by accredited certification body.

4.4 ENVIRONMENT

4.4.1 Environmental Management

The Applicant can achieve maximum 5 Bonus Points under this section.

4.4.1.1 Environmental Management System – Non-core Criteria

Requirements

5 Bonus Points for possessing valid certificate under ISO 14001: Environmental management systems — Requirements with guidance for use or EU Eco-Management and Audit Scheme (EMAS).

The target of the environmental management system shall be set to reduce the environmental impacts during the manufacturing process which include, but are not limited to, the reduction of hazardous substance emissions, energy consumption, CO₂ emissions, secondary environmental load, waste management, water management, etc.

ISO 14001 is the international standard which provides an outline of how to meet the environmental policy and objectives for the business of the applicant.

Eco-Management and Audit Scheme (EMAS) is an environmental management tool which enables organisations to assess, manage, and continuously improve their environmental performance.

Verification

A valid ISO 14001 or EMAS certificate issued by accredited certification body

4.4.2 Regional Product

The Applicant can achieve maximum 5 Bonus Points under this section.

4.4.2.1 Regional Manufactured Equipment – Non-core Criteria

Requirements

5 Bonus Points for products that are manufactured within 800km radius of HKSAR by road transportation; within a 1,600km radius by rail transportation; or within a 4,000km radius by sea transportation. The distance is measured by the direct distance, not by actual travel distance.

Verification

Documents demonstrating the location of the manufacturer and a map showing the distance between the manufacturer and HKSAR.

4.4.3 Human Toxicity and Ecosystem Impact

The Applicant can achieve maximum 5 Bonus Points under this section.

4.4.3.1 Hazardous Substances – Non-core Criteria

Requirements

5 Bonus Points for complying with the maximum allowed levels of restricted substances of product components:

The listed substances shall be less than 0.1% (by weight of the product) present in the final product:

- Lead, mercury, and hexavalent chromium
- Polybrominated biphenyl (PBB) and polybrominated diphenyl ether (PBDE)
- Bis(2-Ethylhexyl) phthalate (DEHP)
- Benzyl butyl phthalate (BBP)
- Dibutyl phthalate (DBP)
- Diisobutyl phthalate (DIBP)

AND

Cadmium (Cd) shall be less than 0.01% (by weight of the product) present in the final product.

The product shall be manufactured in accordance with the EU Directive on the restriction of the use of certain hazardous substances in electrical and electronic

equipment EU 2015/863 (commonly referred to as the Restriction of Hazardous Substances Directive or RoHS).

Verification

Laboratory test report(s) or self-declaration letter. Test report(s) shall be compiled according to the National and International test methods including, but not limited to, IEC 62321.

4.5 PERFORMANCE

4.5.1 Efficiency Metrics

The Applicant can achieve maximum 40 Points under this section.

The Applicant is required to achieve 20 Basic Points under this section. Additionally, the Applicant can achieve maximum 20 Bonus Points under this section.

4.5.1.1 Energy Efficiency – Non-core Criteria

Requirements

5 Bonus Points for obtaining energy efficient label for LED products. The eligible labelling scheme includes:

Grade 2 or above under the Mandatory Energy Efficiency Labelling Scheme (MEELS) from EMSD for LED lamp with a rated voltage of 220V - 240V, operating frequency of 50Hz, wattage up to 60W

OR

International power consumption standard such as Energy Star.

Verification

Valid certificate from MEELS from EMSD, Energy Star, or other equivalent certification.

4.5.1.2 Luminous Efficacy – Core Criteria

Requirements

Points are awarded for achieving high luminous efficacy, as listed in Table 2.

Table 2: Requirements of luminous efficacy and associated points

Points	Luminous efficacy (lm/W)	
	Directional LED	Non-directional LED
10 Basic	≥ 40	≥ 50
10 Basic + 5 Bonus	≥ 65	≥ 80
10 Basic + 10 Bonus	≥ 80	≥ 90
10 Basic + 15 Bonus	≥ 100	≥ 105

Verification

Documentation including, but not limited to product catalogues, technical datasheet, test reports on Luminous Efficacy in accordance to IES LM-79 or other equivalent test standards.

4.5.1.3 Power Factor – Core Criteria

Requirements

10 Basic Points are awarded for achieving minimum allowable power factor for LED lighting, as referenced in Table 3.

Table 3: Minimum allowable power factor for LED lighting

Rated lamp wattage	Minimum allowable power factor
≤ 5 W	0.45
> 5 W to ≤ 25 W	0.65
> 25 W	0.90

Verification

Documentation including, but not limited to product catalogues, technical datasheet, test reports on Power Factor in accordance to IES LM-79 or other equivalent test standards.

4.5.2 Lighting Quality

The Applicant can achieve maximum 20 Points under this section

The Applicant is required to achieve 15 Basic Points under this section. Additionally, the Applicant can achieve maximum 5 Bonus Points under this section.

4.5.2.1 Correlated Colour Temperature – Core Criteria

Requirements

10 Basic Points are awarded for products meeting the targeted correlated colour temperature (CCTs) and Tolerance, listed in Table 4.

The product shall have one of the rated correlated colour temperatures including 2,700K, 3,000K, 3,500K, 4,000K, 4,500K, 5,000K, 5,700K, 6,500K and a flexible CCT consistent with the 7-step chromaticity quadrangles and Duv tolerances as indicated in Table 4. The measured initial CCT and initial Duv shall be within the tolerances of the target CCT and the target Duv of the selected rated CCT.

Table 4: Rated CCT categories

Rated CCT	Target CCT and tolerance (K)	Target Duv and tolerance
2,700 K	2,725 ± 145	0.000 ± 0.006
3,000 K	3,045 ± 175	0.000 ± 0.006
3,500 K	3,465 ± 245	0.000 ± 0.006
4,000 K	3,985 ± 275	0.001 ± 0.006
4,500 K	4,503 ± 243	0.001 ± 0.006
5,000 K	5,028 ± 283	0.002 ± 0.006
5,700 K	5,665 ± 355	0.002 ± 0.006
6,500 K	6,530 ± 510	0.003 ± 0.006
Flexible CCT (2700 – 6500 K)	$T^{1)} \pm \Delta T^{2)}$	$Duv^{3)} \pm 0.006$

1) *T* is chosen to be at 100 K steps (2,800, 2,900, ... , 6,400 K)

2) ΔT is given by $\Delta T = 0.0000108 \times T^2 + 0.0262 \times T + 8$

3) *Duv* is given by $Duv = 57700 \times (1/T)^2 - 44.6 \times (1/T) + 0.0085$

Verification

Documentation including, but not limited to product catalogues, technical datasheet, test reports on Correlated Colour Temperature and Duv in accordance to IES LM-79 or other equivalent test standards.

4.5.2.2 Colour Rendering Index – Core Criteria

Requirements

Points are awarded for products fulfilling the minimum requirements on Colour Rendering Index (CRI), as listed in Table 5.

Table 5: Requirements of Colour Rendering Index and associated points

Points	Measured Initial CRI
5 Basic	≥ 80
5 Basic + 5 Bonus	≥ 90

AND

The measured CRI value shall not be lower than 3 from the rated General CRI value declared by the Applicant in the product specifications.

Verification

Documentation including, but not limited to product catalogues, technical datasheet, test reports on Colour Rendering Index in accordance to IES LM-79 or other equivalent test standards.

4.5.3 Product Life

The Applicant can achieve maximum 30 Points under this section

The Applicant is required to achieve 10 Basic Points under this section. Additionally, the Applicant can achieve maximum 20 Bonus Points under this section.

4.5.3.1 Lifespan for LED Lamp – Core Criteria

Requirements

Points are awarded for LED lamp products achieving minimum lifespan measured in the unit of hours, as listed in Table 6:

Table 6: Requirements on product lifespan and associated points

Points	Lifespan (Hours) for Different Lamp Type		
	Self-ballasted LED lamp	Non self-ballasted LED lamp	LED luminaire
10 Basic	≥ 15,000	≥ 20,000	≥ 35,000
10 Basic + 5 Bonus	≥ 25,000	≥ 35,000	≥ 45,000
10 Basic + 10 Bonus	≥ 35,000	≥ 50,000	≥ 60,000

Note: The lifespan hour is under the condition that the lamp shall deliver at least 70% of initial lumens.

Verification

Laboratory test report(s) or guarantee certificate(s) supplied with the product or made available to the public.

4.5.3.2 Lifespan for Switch – Non-core Criteria

Requirements

5 Bonus Points for switches withstanding over 10,000 on/off cycles.

Verification

Laboratory test report(s) or guarantee certificate(s) supplied with the product or made available to the public.

4.5.3.3 Warranty – Non-core Criteria

Requirements

5 Bonus Points for product with warranty covering repair or replacement for a minimum of 1 year from the date of purchase.

Verification

Guarantee certificate(s) supplied with the product or made available to the public.

4.6 INNOSMART

4.6.1 Innovations & Additions – Non-core Criteria

The Applicant can achieve maximum 5 Bonus Points under this section.

Requirements

5 Bonus Points for achieving significant, measurable environmental performance using new practices, technology, and strategy not addressed in this Standard.

OR

Incorporating various smart technologies to improve efficiency, reduce energy consumption, and optimize performance as exemplified by the following examples:

- Smart Controls and Automation
- Modular LED Systems
- IoT Sensors

Verification

Report with a maximum length of 1,000 words, outline the objectives, solution, and evaluation of the performance achieved by the proposed Smart and Innovative Technologies.

AND

Include attachments that provide evidence of implementation, along with relevant technical specifications that support the claims made in the report.

5. SCORING

The points for meeting each criterion stated in this Standard are summarized below.

Table 7: Points to be awarded under the assessment criteria of this Standard

Label	Evaluation criteria		Points		Related Beam Plus Credits
			Basic	+Bonus	
	Product Information [CORE]		5	-	
Carbon	CFP Quantification		-	+10	
Resource	Circularity	Recyclability	-	+5	
		Packaging Requirement	-	+5	
	Waste Management	Waste Management Plan	-	+5	
	Water Management	Water Consumption Reporting	-	+5/+10	
		Water Recycling Program			
		Water Management System			
	Energy Management	Energy Management Plan	-	+5/+10	
Energy Management System					
Environment	Environmental Management	Environmental Management System	-	+5	
	Regional Product	Regional Manufactured Equipment	-	+5	
	Human Toxicity and Ecosystem Impact	Hazardous Substances	-	+5	
Performance	Efficiency Metrics	Energy Efficiency	-	+5	
		Luminous Efficacy [CORE]	10	+5/+10/ +15	EU2 / EU3
		Power Factor [CORE]	10	-	
	Lighting Quality	Correlated Colour Temperature [CORE]	10	-	
		Colour Rendering Index [CORE]	5	+5	
	Product Life	Lifespan for LED Lamp [CORE]	10	+5 / +10	
		Lifespan for Switch	-	+5	
Warranty		-	+5		
InnoSmart	Innovations & Additions		-	+5	IA
Total:			50	+110	

Related BEAM Plus Credits refer to these relevant credits under BEAM Plus New Buildings Version 2.0, as listed below:

- MW 9: Use of Green Products
- EU 2: Reduction of CO₂ Emissions
- EU 3: Peak Electricity Demand Reduction
- Innovations and Additions