

CONSTRUCTION INDUSTRY COUNCIL

CIC GREEN PRODUCT CERTIFICATION

Assessment Standard

Technical Requirements

Compact Fluorescent Lamp



CIC GREEN
PRODUCT CERTIFICATION

(Version 2)

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COMPACT FLUORESCENT LAMP

Summary of Assessment Criteria

CORE CRITERIA

Criteria	Requirements	Verification	Points		Index					
			Basic	+Bonus						
Product Information	Provide following information with delivered products or 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, webpages	5	-	4.1.1					
PEFORMANCE										
Efficiency Metrics	Energy Efficiency: Obtain certain energy labels for integrated or non-integrated CFL.	Relevant certifications	20	-	4.5.1.1					
	Maximum Allowable Power Loss: Integrated CFL lamps shall fulfil the maximum allowable power loss requirements. Non-integrated CFL lamps are exempted.	Laboratory test report(s)	5	-	4.5.1.3					
	Power Factor: The power factor of the product shall meet: <table border="1" style="width: 100%; margin-top: 5px;"> <thead> <tr> <th style="width: 30%;">Points</th> <th>Power factor</th> </tr> </thead> <tbody> <tr> <td>5 Basic + 10 Bonus</td> <td>≥ 0.85</td> </tr> <tr> <td>5 Basic</td> <td>≥ 0.8</td> </tr> </tbody> </table>	Points	Power factor	5 Basic + 10 Bonus	≥ 0.85	5 Basic	≥ 0.8	Laboratory test report(s)	5	+10
Points	Power factor									
5 Basic + 10 Bonus	≥ 0.85									
5 Basic	≥ 0.8									
Lighting Performance	Total Harmonic Distortion: < 30%.	Laboratory test report(s)	10	-	4.5.2.2					
Product Life	Durability: Meet product life requirements (measured in hours) for different points awarded.	Laboratory test report(s)	5	+5 /+10	4.5.3.1					
		Subtotal:	50	+20						

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 provide an Environmental Product Declaration (EPD).	CFP quantification report OR Environmental Product Declaration (EPD)	+10	4.2.1
RESOURCE				
Circularity	Recyclability: Develop a recycling plan for the product and declared options for reuse, recycling, recovery, and disposal.	Documentation on 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 a 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 <i>OR</i> 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 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.	Location map with distance between manufacturer and HKSAR	+5	4.4.2.1
Human Toxicity and Ecosystem Impact	Hazardous Substances: Products shall not contain radioisotopes; <i>AND</i> Product components shall not exceed the concentration values of the restricted substances as referenced below: <ul style="list-style-type: none"> Lead, cadmium, mercury, and hexavalent chromium: < 0.1% by weight respectively; Polybrominated biphenyl (PBB) and polybrominated diphenyl ether (PBDE): < 0.1% by weight respectively Bis(2-Ethylhexyl) phthalate (DEHP): <0.1% Benzyl butyl phthalate (BBP): <0.1% Dibutyl phthalate (DBP): <0.1% Diisobutyl phthalate (DIBP): <0.1% 	Laboratory test report(s), MSDS, self-declaration letter, and any production documents	+5	4.4.3.1
	Mercury Content: Points are awarded as per mercury content requirement below: <ul style="list-style-type: none"> ≤5mg mercury content (+5 Bonus) ≤3mg mercury content (+10 Bonus) 	Laboratory test report(s), MSDS, and any production documents	+5/ +10	4.4.3.2
PERFORMANCE				
Efficiency Metrics	Luminous Efficiency: Meet the requirement of luminous efficacy and associated points shown in Table 2.	Conformation document and relevant laboratory test	+5	4.5.1.2
Lighting Performance	Colour Rendering Index: Initial colour rendering index shall be equal to or greater than 80; <i>AND</i> Shall not have decreased by more than 3 points from the rated general CRI value.	Relevant laboratory test report(s) on the colour rendering index	+5	4.5.2.1

Criteria	Requirements	Verification	Points	Index
			+Bonus	
INNOSMART				
Innovations & Additions	Adopt new practice, technology and strategy; <i>OR</i> Achieve exemplary performance.	Narrative with supporting documents	+5	4.6.1
		Subtotal:	+85	

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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

Compact fluorescent lamps (CFLs) consume about 80% less electrical power than incandescent lamps for the same light output. In addition, the life expectancy of CFLs is generally about 8 to 10 times that of incandescent lamps. However, CFLs usually contain mercury or its compound in the tube gases, which is hazardous to human health. Other environmental concerns of using CFLs include their poor power factor, high harmonic current demand, and the potential electromagnetic interference effects of the current-switching nature of the associated electronic ballasts.

The purposes of the assessment criteria developed for CFLs are to conserve energy consumption and to minimise the impacts to both the environment and human health through stringent control on the production process, use of materials, and energy efficiency. The criteria in this Standard are based on relevant worldwide eco-labelling schemes and some existing life cycle assessment (LCA) studies.

2. SCOPE

There are two types of CFLs: (i) integrated lamps; and (ii) non-integrated lamps. Integrated lamps combine the tube and ballast in a single unit. In contrast, non-integrated CFLs have the ballast permanently installed in the luminaire, and only the lamp bulb has to be changed at its end of life. This Standard applies to CFLs with and without the integrated ballasts and controllers for general illumination purposes.

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

Applicant: Organisations which apply for the label of the CIC Green Product Certification of the Construction Industry Council

Ballast adapter: A unit containing all elements that are necessary for starting and maintaining stable operation of the lamp, with an integral socket for a lamp

CIC: Construction Industry Council

CRI The Color Rendering Index (CRI) is a scale from 0 to 100 that measures how accurately a light source displays the true colors of objects compared to natural daylight. A higher CRI (close to 100) means colors appear more natural and vivid, which is important for settings like retail, art, and medical lighting. Lower CRI values indicate less accurate color rendering.

<i>CFL:</i>	Compact Fluorescent Lamp, a fluorescent lamp which is small and compact that may be self-ballasted or function with a ballast adapter
<i>CNAS:</i>	China National Accreditation Service for Conformity Assessment
<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>IARC:</i>	International Agency for Research on Cancer
<i>ISO:</i>	International Organisation for Standardisation
<i>IEC:</i>	International Electrotechnical Commission
<i>Luminous efficacy:</i>	A ratio of luminous flux emitted by a lamp to the electrical power consumed by the lamp
<i>MAPL</i>	Maximum Allowable Power Loss (MAPL) is the highest permitted power loss in the electronic ballast of an integrated CFL. It represents the electrical energy lost as heat or inefficiency within the ballast rather than used for lighting.
<i>MEELS:</i>	Mandatory Energy Efficiency Labelling Scheme. Under this scheme, energy labels are required to be displayed 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, the MSDS and information therein must not be more than 5-years old
<i>MiMEP:</i>	Multi-trade integrated Mechanical, Electrical and Plumbing
<i>Power factor:</i>	The ratio of real power versus apparent power in the circuit
<i>Self-ballasted lamp:</i>	A unit that incorporates and permanently encloses all elements that are necessary for starting and maintaining a stable operation of the lamp, but any replaceable or interchangeable parts are excluded. The unit including all elements is discarded at the end of the lamp's life
<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
<i>Total harmonic distortion:</i>	The ratio of the sum of the powers of all harmonic components to the power of the fundamental frequency
<i>VEELS:</i>	Voluntary Energy Efficiency Labelling Scheme

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”. “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

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

4.1.1 Product Information – Core Criteria

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 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 organisational 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 the 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 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 the 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 certificate 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 15 Bonus Points under this section.

4.4.3.1 Hazardous Substances – Non-core Criteria

Requirements

5 Bonus Points for demonstrating the following:

The products shall not contain radioisotopes; and

The product components (i.e. the circuit boards, electrical, electronic, plastic components, etc.) shall be manufactured in accordance with the EU Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment 2011/65/EU (commonly referred to as the Restriction of Hazardous Substances Directive or RoHS).

The maximum concentration values of the RoHS restricted substances are:

- Lead, cadmium, mercury, and hexavalent chromium: <0.1% by weight respectively;
- Polybrominated biphenyl (PBB) and polybrominated diphenyl ether (PBDE): <0.1% by weight respectively
- Bis(2-Ethylhexyl) phthalate (DEHP): <0.1%
- Benzyl butyl phthalate (BBP): <0.1%
- Dibutyl phthalate (DBP): <0.1%
- Diisobutyl phthalate (DIBP): <0.1%

Verification

Laboratory test report(s), MSDS, self-declaration letter, and production documentation.

Test report(s) shall be compiled according to the National and International test methods including but not limited to IEC 62321.

4.4.3.2 Mercury Content – Non-core Criteria

Requirements

5 Bonus Points for \leq 5mg mercury content.

10 Bonus Points for \leq 3mg mercury content.

CFL manufacturer shall use the encapsulated dosing methods to minimise mercury exposure to workers during the product manufacturing stage. Other methods of closed, accurate, and precise dosing would be acceptable if proven, with documentation, to have similar or better dose efficiency and protection against worker exposure.

Verification

Laboratory test report(s) on mercury content and documentation showing that encapsulated dosing methods or other equivalent methods have been used.

4.5 PERFORMANCE

4.5.1 Efficiency Metrics

The Applicant can achieve maximum 45 Points under this section.

The Applicant is required to achieve 30 Basic Points under this section. Additionally, the Applicant can achieve maximum 15 Bonus Points under this section.

4.5.1.1 Energy Efficiency – Core Criteria

Requirements

20 Basic Points for meeting the following requirements:

- The integrated CFL products shall have obtained a Grading Type Energy Label under the Mandatory Energy Efficiency Labelling Scheme (MEELS) of the Electrical and Mechanical Services Department (EMSD) of the HKSAR Government Grade 1 label.
- The non-integrated CFL products shall have obtained a Recognition Type Energy Label under the Voluntary Energy Efficiency Labelling Scheme (VEELS) of the EMSD of the HKSAR Government.

Verification

The certificate of Energy Label under Energy Efficiency Labelling Scheme or other relevant certification.

4.5.1.2 Luminous Efficiency – Non-core Criteria

Requirements

5 Bonus Points for meeting the following requirements:

Table 2: Requirements of luminous efficacy and associated points

Lamp Type	Rated Lamp Wattage (Lw)	Luminous Efficacy (lumen/W)
Linear	< 30W	≥ 80
	≥ 30W	≥ 85
Non-integrated Type CFLs without Built-in Control Gear	≤ 10W	50
	11-30W	65
	≥ 31W	75
Integrated Type CFLs with Built-in Control Gear	≤ 10W	45
	11-20W	50
	21W-30W	55
	≥ 31W	60

Verification

Conformation document which laid out in IEC/ISO 17025, and tested by laboratory according to CIE 84, IEC 60901, and IEC 60969.

4.5.1.3 Maximum Allowable Power Loss – Core Criteria

Requirements

5 Basic points if the Maximum Allowable Power Loss (MAPL) of electronic ballast in the integrated CFL products could fulfil the requirements as stated in Maximum Allowable Power Loss of Electronic Ballast, in General Specification for Electrical Installation in Government Buildings, published by Hong Kong Architectural Services Department.

Non-integrated CFL products are exempted from this requirement.

Verification

Relevant laboratory test report(s) on the maximum allowable power loss.

4.5.1.4 Power Factor – Core Criteria

Requirements

5 Basic point for the CFL products shall have a power factor (PF) of equal to or greater than 0.8.

10 Bonus points will be awarded for product with a higher PF according to Table 3.

Table 3: Limits of power factor and associated points

Points	Power factor
5 Basic + 10 Bonus	≥ 0.85
5 Basic	≥ 0.8

Verification

Relevant laboratory test report(s) on the power factor.

4.5.2 Lighting Performance

The Applicant can achieve maximum 15 Points under this section.

The Applicant is required to achieve 10 Basic Points under this section. Additionally, the Applicant can achieve maximum 5 Bonus Points under this section.

4.5.2.1 Colour Rendering Index – Non-core Criteria

Requirements

5 Bonus Points for when the measured initial general colour rendering index (CRI) values of the product shall be equal to or greater than 80 and shall not have decreased by more than 3 points from the rated general CRI value (i.e. the General CRI declared by the Applicant).

Verification

Relevant laboratory test report(s) on the colour rendering index. e.g LM-79.

4.5.2.2 Total Harmonic Distortion – Core Criteria

Requirements

10 Basic Points if the total harmonic distortion (THD) of CFL products is below 30%.

THD can be calculated using the equation below:

$$THD = \frac{\sqrt{V_2^2 + V_3^2 + V_4^2 + \dots + V_n^2}}{V_1} \times 100\%$$

where V_i is the RMS voltage of i_{th} harmonic; $i = 1$ is the fundamental frequency.

Verification

Relevant laboratory test report(s) on the total harmonic distortion.

4.5.3 Product Life

The Applicant can achieve maximum 15 Points under this section.

The Applicant is required to achieve 5 Basic Points under this section. Additionally, the Applicant can achieve maximum 10 Bonus Points under this section.

4.5.3.1 Durability – Core Criteria

Most standards have requested an average lamp life of not less than 8,000 hours. It is recommended to follow the below requirements on product life:

Table 4: Requirements on product life of compact fluorescent lamps

Points	Product life (hours)
5 Basic + 10 Bonus	≥ 12,000
5 Basic + 5 Bonus	≥ 10,000
5 Basic	≥ 8,000

Verification

Laboratory test report(s) on product life and guarantee certificate.

4.6 INNOSMART

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

4.6.1 Innovations & Additions – Non-core Criteria

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:

- BMS Integration
- Predictive Maintenance using AI/ML
- Integrated Optimization with Building Automation System (BAS)

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 5: 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	
Resources	Circularity	Recyclability	-	+5	
		Packaging Requirement	-	+5	
	Waste Management	Waste Management Plan	-	+5	
	Water Management	Water Consumption Reporting	-	+5/+10	
		Water Recycling Program			
	Energy Management	Energy Management Plan	-	+5/+10	
Energy Management System		-			
Environment	Environmental Management	Environmental Management System	-	+5	
	Regional Product	Regional Manufactured Equipment	-	+5	MW 8
	Human Toxicity and Ecosystem Impact	Hazardous Substances	-	+5	
Mercury Content		-	+5/+10		
Performance	Efficiency Metrics	Energy Efficiency [CORE]	20	-	EU 2 / EU 3
		Luminous Efficiency	-	+5	
		Maximum Allowable Power Loss [CORE]	5	-	
		Power Factor [CORE]	5	+10	
	Lighting Performance	Colour Rendering Index	-	+5	
		Total Harmonics Distortion [CORE]	10	-	
Product Life	Durability [CORE]	5	+5/+10		
InnoSmart	Innovations & Additions		-	+5	IA
Total:			50	+105	

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

- MW 8: Regional Materials
- MW 9: Use of Green Products
- EU 2: Reduction of CO₂ Emissions
- EU 3: Peak Electricity Demand Reduction
- Innovations and Additions