CONSTRUCTION INDUSTRY COUNCIL

CIC GREEN PRODUCT CERTIFICATION

Assessment Standard

Technical Requirements

Chiller

(Version 2)

CHILLER

Summary of Assessment Criteria

CORE CRITERIA

Criteria	Requirements	Verification	Points		Index
			Basic	+Bonus	
Product Information	Provide the following information with delivered products or be made accessible to public: • 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
ENVIRONMENT					
Human Toxicity and Ecosystem Impact	Noise Level: All products shall meet the basic requirements of noise level: ≤ 90 dBA. 5 bonus points will be granted if: • ≤ 80 dBA for air-cooled chillers • ≤ 85 dBA for water-cooled chillers	Documentation includes, but not limited to product catalogue, technical datasheets and test report(s).	**10**	+5	4.4.3.2

	Eco-friendly Refrigerant:
	• Shall have no ozone depletion potential or have a global warming potential of < 750
	• Safety group of the refrigerant:
	  • must be A1 and A2L according to ASHRAE 34-2013
	  OR
	  • could be B1 and B2L according to ASHRAE 34-2013 if the refrigerant leakage rate is equal to or less than 0.5%.
		Laboratory test report(s) and any documentation stating the refrigerant used and refrigerant leakage rate (if applicable)	**10**	-	4.4.3.3

	Refrigerant Leakage Rate: All products shall meet the basic requirement of conducting the leakage testing and the refrigerant leakage shall be equal to or less than 1.0% of full refrigerant charge. 5 bonus points will be granted if product incorporates a leak detection system and send the alert to the Building Management System (BMS) for the leakage.	Laboratory test report(s) and documentation on the refrigerant leakage rate, loss, and charge Drawing or product catalogues demonstrating the leak detection system	**5**	+5	4.4.3.4

Criteria	Requirements	Verification	Points		Index
			Basic	+Bonus	
PERFORMANCE					
Efficiency Metrics	Energy Efficiency: Achieve at least 2% energy efficiency improvement in COP/IPLV than BEC/ ASHRAE as the basic requirement. Bonus points will be granted according to requirements outlined in Table 2 of Section 4.5.1.1.	Documentation including, but not limited to test reports, product catalogue, technical datasheet.	**20**	+5 / +10 / +15 / +20	4.5.1.1
		Subtotal:	**50**	+30	

NON-CORE CRITERIA

Criteria	Requirements	Verification	Points +Bonus	Index
CARBON				
CFP Quantification	Provide a 3rd 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; *OR* Shall be comprised of 100% recycled materials, readily recyclable materials, or decomposable materials: *OR* 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
	Design for Disassembly: • Chiller unit components, such as evaporator, condenser, and compressor, shall be demountable with separable shells for take-apart applications; and • The separable shell feature includes a bolt-together design between the evaporator and condenser and allows the shells to be separated in the field.	Documentation including but not limited to product label, product catalogue, and written declaration	+5	4.3.1.3
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

Criteria	Requirements	Verification	Points +Bonus	Index
	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
	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 Products	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: No paint is used in the products, *OR* Limit the concentration of Lead, Cadmium, Chromium (VI), Mercury, or their compounds in paint below 0.01% by weight; Limit the VOC content in paint below 250g/L.	Laboratory test report(s), or self-declaration letter	+5	4.4.3.1
	Identification of Lubricating Oil: Indicate the correct lubricant for the type of refrigerant used in the chiller operating instructions; *OR* Oil free compressor is used.	Documentation related to the lubricant used and relevant information	+5	4.4.3.5
INNOSMART				
Innovations & Additions	Incorporating various solution, and smart technologies to improve efficiency, reduce energy consumption, evaluation of the performance and optimize performance.	Narrative with supporting documents	+5	4.6.1
		Subtotal:	+70	

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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

Air conditioning systems account for approximately 30% of the total energy consumption in Hong Kong. Chiller is one of the most energy intensive components in the centralised cooling system. Another major environmental concern about chiller is the use of refrigerant. It is the working fluid inside a refrigerative chiller, which could cause significant damage to the earth's protective ozone layer if they are released into the atmosphere. The refrigerant type and charge, as well as the energy efficiency are often considered in most of the environmental studies regarding the air conditioning systems.

The purposes of the assessment criteria developed for chillers are, therefore, to conserve resources and energy consumption, to reduce the environmental impact of refrigerants, to minimise the use of hazardous substances, and to encourage reuse, recycling, and responsible disposal of the product.

2. SCOPE

The types of chillers covered by this Standard include air-cooled, water-cooled, and absorption chillers which can be driven by electric motor or other means. Evaporative chiller is excluded from this Standard.

The types of cooling, compressor, and refrigerants shall be specified clearly in each application. **ONE** application is only for **ONE** product series with same serial number up to **5 (FIVE)** models (e.g. different cooling capacity). All the related products have to be listed on the submitted documents. For example, water-cooled – centrifugal –134a (model e.g. ABC-D-134) is regarded as one application.

Subsequent application is available for similar products with the same product serial number of a labelled product series, which is only eligible for applying within the validity period of the label.

Each subsequent application shall include **5 (FIVE)** models, while maximum **5 (FIVE)** subsequent application per each application.

3. DEFINITIONS

Applicant:	Organisations which apply for the label of the CIC Green Product Certification of the Construction Industry Council
AHRI:	Air Conditioning, Heating and Refrigeration Institute
ASHRAE:	American Society of Heating, Refrigerating and Air-Conditioning Engineers
Air-conditioning:	The process of treating air to control simultaneously its temperature, humidity, and distribution to meet the comfort requirements of the occupants of the conditioned spaces

BEC:	Building Energy Code
BEEO:	Buildings Energy Efficiency Ordinance
Biological Cycle:	The cycle by which materials or parts are released to, and ideally reprocessed in, the environment via composting, biodegradation, nutrient extraction, or other biological metabolic pathways
CIC:	Construction Industry Council
CNAS:	China National Accreditation Service for Conformity Assessment
Cooling capacity:	The rated ability of the chiller to cool, measured in tons. One ton of cooling is equal to the amount of cooling provided by one ton (2,000 lbs) of melting ice in one day (12,000 Btu/h)
Coefficient of performance (COP):	A ratio of the cooling capacity in watts (W) to the total power input, in watts (W) at any specified set of standard rating conditions, expressed in watts / watts (W/W)
Energy management programme:	A programme to achieve and sustain efficient and effective use of energy including policies, practices, planning activities, responsibilities, and resources that affect the organisation's performance for achieving the objectives and targets of the energy policy.
Global warming potential (GWP):	The ratio of the warming of atmosphere caused by one substance to that caused by a similar mass of carbon dioxide
HKAS:	Hong Kong Accreditation Service
HKGBC:	The Hong Kong Green Building Council Limited
HOKLAS:	The Hong Kong Laboratory Accreditation Scheme
IARC:	International Agency for Research on Cancer
ISO:	International Organisation for Standardisation
MSDS:	Material safety data sheet. To qualify as suitable, the MSDS and information therein must not be more than 5-years old
Integrated part load value (IPLV):	This is a performance characteristic developed by the AHRI, which is most commonly used to describe the performance of a chiller capable of capacity modulation
Ozone depleting potential (ODP):	The ratio of the ability of a molecule to react with the ozone contained in the Earth's stratosphere compared to a CFC-12 molecule, as determined by the US Environmental Protection Agency (EPA)

Ozone depletion substances:	The chemical compounds defined by the 1990 Clean Air Act Amendments as ozone depletion substances
Refrigerant:	The working fluid of a vapour-compression heat transferring system. The refrigerant transfers heat from one location to another by boiling and condensing
Technical Cycle:	The cycle by which a product's materials or parts are reprocessed for a new product use cycle via recycling, repair, refurbishment, remanufacturing, or reuse
Third-party:	An entity without any financial interest or stake in the sales of the product or service being evaluated or other conflict of interest
VOC:	Volatile organic compounds. VOCs are organic chemical compounds that have high enough vapour pressures under normal conditions to significantly vaporize and enter the atmosphere. VOCs are major contributors or precursors to the formation of ozone and smog.

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 can achieve maximum 5 Basic Points under this section.

Requirements

5 Basic Points for providing the following product information for compliance:

- 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 15 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 followings:

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.

The packaging requirements are relevant to all primary packaging materials, i.e. those being used to envelop the product and hold it. The primary packaging materials are usually in direct contact with the contents and shall be in the minimal amount of distribution and/or use as they may eventually be disposed by the consumers.

Verification

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

4.3.1.3 Design for Disassembly – Non-core Criteria

Requirements

5 Bonus Points for the chiller system incorporated design for disassembly features, specifically:

- Chiller unit components, such as evaporator, condenser, and compressor, shall be demountable with separable shells for take-apart applications; and
- The separable shell feature includes a bolt-together design between the evaporator and condenser and allows the shells to be separated in the field.

Verification

Documentation including but not limited to product label, product catalogue, manuals and written declaration.

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 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 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, CO_2 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 45 Points under this section.

The Applicant is required to achieve 25 Basic Points under this section. Additionally, the Applicant can achieve maximum 20 Bonus Points under this section.

4.4.3.1 Hazardous Substances – Non-core Criteria

Requirements

5 Bonus Points shall be awarded if:

No paint is used on the products

OR

Both requirements are fulfilled as listed below for the paint used on the products:

- Limit the concentration of Lead, Cadmium, Chromium (VI), Mercury, or their compounds in paint below 0.01% by weight; and
- Limit the VOC content in paint below 250g/L.

Products shall be tested based on the requirement as stated in IEC 62321-4:2013, IEC 62321-5:2013, IEC 62321-7-2:2017 (or the latest version). Other related testing methods are also acceptable with justification provided by the Applicant.

Verification

Laboratory test report(s) or self-declaration letter. The test report(s) shall be compiled according to IEC 62321 or other equivalent standards.

4.4.3.2 Noise Level – Core Criteria

Requirement

10 Basic Points shall be awarded for the product that meets the noise level $\leqslant$ 90 dBA;

Additionally, 5 Bonus Points will be awarded if operating noise level can fulfil requirements below:

- $\leqslant$ 80 dBA for air-cooled chillers
- $\leqslant$ 85 dBA for water-cooled chillers

Verification

Documentation demonstrating the noise evaluation is conducted in accordance with the AHRI Standard 575 - 2008, Method of Measuring Machinery Sound Within an Equipment Space. Other related testing methods are also acceptable with justification provided by the Applicant. Documentation includes, but not limited to product catalogue, technical datasheets and test report(s).

4.4.3.3 Eco-friendly Refrigerant – Core Criteria

Requirement

10 Basic Points shall be awarded for product using eco-friendly refrigerant which complies with the following requirement:

- The refrigerant used shall have no ozone depletion potential or have a global warming potential of < 750.
- The refrigerant used shall also comply with the following requirement:
  - Safety group of the refrigerant must be A1 and A2L according to ASHRAE 34-2013

    OR
  - Safety group of the refrigerant could be B1 and B2L according to ASHRAE 34-2013 if the refrigerant leakage rate is equal to or less than 0.5%.

Verification

Laboratory test report(s) and any relevant documentation on the refrigerant leakage rate, loss, and charge. The leak testing method(s) shall be selected in accordance with ASHRAE Standard 15-2024 (Safety Standard for Refrigeration Systems), Section 9.13.6.

4.4.3.4 Refrigerant Leakage Rate– Core Criteria

Requirement

Leakage Testing

5 Basic Points shall be awarded for achieving a refrigerant leakage rate of 1.0% or less of the total refrigerant charge:

- Product shall conduct the leakage testing that proves the refrigerant leakage shall be equal to or less than 1.0% of full refrigerant charge.
- Manufacturer shall provide a factory testing report including the information of testing methodology and all calculation details leading to the end result of refrigerant leakage rate.

Leak Detection System

5 Bonus Points are granted for incorporating a leak detection system:

- Product shall incorporate a leak detection system that sends alerts to the Building Management System (BMS) for leakage.
- The leakage detection system shall be able to communicate with the Building Management System (BMS) via an open standard communication interface including but not limited to BACnet, ZigBee, and LonWorks.

Verification

Laboratory test report(s) and any relevant documentation on the refrigerant used, refrigerant leakage rate, loss, and charge. The leak testing method(s) shall be selected in accordance with ASHRAE Standard 15-2024 (Safety Standard for Refrigeration Systems), Section 9.13.6.

Documentation demonstrating the incorporation of leak detection system, including but not limited to drawings, product catalogues.

4.4.3.5 Identification of Lubricating Oil – Non-core Criteria

Requirements

5 Bonus Points are awarded if the manufacturer indicates either of the following:

- The correct lubricant for the type of refrigerant used in the chiller operating instructions

  OR

- Oil free compressor is used.

Verification

Documentation related to the lubricant used and relevant information as stated above, including but not limited to product catalogues and manuals.

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 – Core Criteria

Requirements

Points are rewarded for demonstration compliance of COP or IPLV as listed below:

*Table 2: Points Awarded for Meeting COP Requirements at Full Load **or** IPLV*

Points	Percentage improvement in COP at full load ***or*** **IPLV**
20 Basic	+2%
20 Basic + 5 Bonus	+8%
20 Basic + 10 Bonus	+13%
20 Basic + 15 Bonus	+17%
20 Basic + 20 Bonus	+20%

Note:

For electrical chiller, the product shall exceed the minimum COP at full load as specified in BEC 2021, Table 6.12b or IPLV as specified under Path B in Table 6.8.1C of ANSI/ASHRAE Standard 90.1-2019 (SI Edition).

For absorption chiller, the product shall exceed the minimum COP at full load as specified in Table 6.8.1C of ANSI/ASHRAE Standard 90.1-2019 (SI Edition).

Verification

Documentation including, but not limited to test reports, product catalogues, technical datasheet.

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.

Examples include the following:

- Multi-trade Integrated MEP (MiMEP)
- Smart Controls and Automation
- Energy-Efficient Designs
- Cooling Efficiency

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 3: 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	
		Design for Disassembly	-	+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	
		Noise Level [CORE]	10	+5	SS 5
		Eco-friendly Refrigerant [CORE]	10	-	MW 7
		Refrigerant Leakage Rate [CORE]	5	+5	
		Identification of Lubricating Oil	-	+5	
Performance	Efficiency Metrics	Energy Efficiency [CORE]	20	+5/+10/ +15/+20	EU 2 / EU 3
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 7: Ozone Depleting Substances
- MW 9: Use of Green Products
- SS 5: Noise Control for Building Equipment
- EU 2: Reduction of CO_2 Emissions
- EU 3: Peak Electricity Demand Reduction
- Innovations and Additions