

# CONSTRUCTION INDUSTRY COUNCIL

## CIC GREEN PRODUCT CERTIFICATION

### *Assessment Standard*

### *Technical Requirements*

### **Air Handling Unit**



**CIC GREEN**  
PRODUCT CERTIFICATION

(Version 2)

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## Air Handling Unit

### *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"> <li>• Country of origin</li> <li>• Basic product specifications</li> <li>• Installation method</li> <li>• Instructions for consumer product disposal</li> <li>• Operation &amp; Maintenance Manual</li> </ul>	Documentation including but not limited to product catalogue, technical datasheet, and webpages	5	-	4.1.1	
<b>ENVIRONMENT</b>						
Human Toxicity and Ecosystem Impact	Noise Level: Products shall not exceed the noise levels as stated in Table 2.	Documentation including, but not limited to, product catalogue and test report(s).	10	-	4.4.3.2	
<b>PERFORMANCE</b>						
Efficiency Metrics	Fan Efficiency: The fan operating efficiency at all intended operating points shall not be less than 15 percentage point below the fan peak total efficiency as required in AMCA 205-12. Products shall use forward or backward curved fan with air foil blades. Points are awarded for demonstrating compliance of Fan Efficiency Grade (FEG) as listed below:	Documentation including, but not limited to, product catalogue and test report(s).	15	+5	4.5.1.1	
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Points</th> <th style="width: 50%;">Efficiency Grade</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">15 Basic</td> <td style="text-align: center;">&gt;FEG67</td> </tr> <tr> <td style="text-align: center;">15 Basic+ 5 Bonus</td> <td style="text-align: center;">&gt;FEG80</td> </tr> </tbody> </table>					Points
Points	Efficiency Grade					
15 Basic	>FEG67					
15 Basic+ 5 Bonus	>FEG80					
	Motor Efficiency: Motors used for the fan in the AHU shall satisfy the efficiency classification in IEC 60034-30-1. Points are awarded for demonstrating compliance of motor efficiency class as per below.	Documentation including, but not limited to, product catalogue and test report(s).	15	+5	4.5.1.2	

Criteria	Requirements		Verification	Points		Index					
				Basic	+Bonus						
	<table border="1"> <thead> <tr> <th>Points</th> <th>Efficiency Class</th> </tr> </thead> <tbody> <tr> <td>15 Basic</td> <td>IE3</td> </tr> <tr> <td>15 Basic+ 5 Bonus</td> <td>IE4</td> </tr> </tbody> </table>	Points	Efficiency Class	15 Basic	IE3	15 Basic+ 5 Bonus	IE4				
Points	Efficiency Class										
15 Basic	IE3										
15 Basic+ 5 Bonus	IE4										
System Performance and Reliability	<p>Casing Performance:                      All products shall meet the basic requirements of casing performance in Table 5 including, but not limited to, mechanical strength, air leakage, thermal transmittance, thermal bridging, and acoustic insulation.                      Additional 5 bonus points will be granted if 3 out of 5 bonus criteria are met.</p>	Documentation including, but not limited to, product catalogue and test report(s).	5	+5	4.5.2.1						
		<b>Subtotal:</b>	<b>50</b>	+15							

## NON-CORE CRITERIA

Criteria	Requirements	Verification	Points	Index
			+Bonus	
<b>CARBON</b>				
CFP Quantification	Provide a 3 <sup>rd</sup> 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 <b>OR</b> Environmental Product Declaration (EPD)	+10	4.2.1
<b>RESOURCE</b>				
Circularity	Recyclability: Developed 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
	Design for Disassembly: <ul style="list-style-type: none"> <li>The blowers and motors shall be demountable from enclosure for cleaning, repair, replacement or maintenance purpose; and</li> <li>Fan impeller scroll casing shall be removable for fan blades cleaning.</li> </ul>	Documentation such as 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 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

Criteria	Requirements	Verification	Points	Index
			+Bonus	
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
<b>ENVIRONMENT</b>				
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 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, <i>OR</i>  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
<b>PERFORMANCE</b>				
System Performance and Reliability	Heat Recovery: All heat exchangers shall be fitted with seals to minimize air leakage; the heat recovery classes at balanced mass flow conditions (1:1) shall be fulfilled the following requirements of $\eta_e$ 1:1 min [%] $\geq 71$ with $\eta_e$ values based on calculation according to EN 13053:2019 or equivalent.	Documentation including but not limited to product catalogue and test reports	+5	4.5.2.2
<b>INNOSMART</b>				
Innovations & Additions	Achieving significant, measurable environmental performance using new practices, technology, and strategy not addressed in this Standard. <i>OR</i> Incorporating various smart technologies to improve efficiency, reduce energy consumption, and optimize performance.	Narrative with supporting documents	+5	4.6.1
		<b>Subtotal:</b>	+75	

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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](mailto:cicgpc@hkgbc.org.hk)

## 1.2 BACKGROUND

Air handling unit (AHU) is a device that regulates and circulates the air supplied into the buildings. It may be designed to supply constant or variable air volume for low-, medium-, or high-velocity air distribution. The air delivered into the building will normally undergo thermo-hygrometric and indoor air quality treatment specified by each project. AHUs collect and mix outdoor air with returning air from building spaces. Before discharging to the buildings, AHUs treat the air by filtering, cooling and/or heating, and humidifying and/or dehumidifying. AHUs can provide functions of ventilation, removal of dust, gas, outdoor particles, and microorganisms, heating, cooling, humidification, dehumidification, heat recovery, and regeneration.

Air handling unit can place a significant burden on the environment. With increasing environmental claims of air handling unit in the market, a more comprehensive and systematic approach to assess the environmental impacts of the air handling unit shall be developed. The aim of this Standard is to help designers and end-users choose greener products by conserving resources, reducing the amount of waste disposal in landfills, and reducing the impact to human health throughout the life cycle of air handling unit. The development of the assessment criteria in this Standard has made references to worldwide relevant eco-labelling schemes and some existing life cycle assessment (LCA) studies.

## 2. SCOPE

The scope of this Standard is applicable to both ‘blow through’ and ‘draw through’ types of AHUs.

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 under the CIC Green Product Certification of the Construction Industry Council

*ASTM:* American Society for Testing and Materials

*AMCA:* Air Movement and Control Association International, Inc.

*GB:* Chinese National Standards

*BS:* British Standards

*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

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<i>CIC:</i>	Construction Industry Council
<i>CNAS:</i>	China National Accreditation Service for Conformity Assessment
<i>Continuous duty:</i>	The motor is designed to run continuously under its rated load without overheating or damage.
<i>DIN:</i>	German institute for standardisation
<i>EN:</i>	European Standard
<i>FEG:</i>	Fan Efficiency Grade
<i>GB:</i>	Chinese National Standards
<i>HKAS:</i>	Hong Kong Accreditation Service
<i>HKGBC:</i>	Hong Kong Green Building Council
<i>HOKLAS:</i>	The Hong Kong Laboratory Accreditation Scheme
<i>ISO:</i>	International Organisation for Standardisation
<i>IE:</i>	International Efficiency
<i>IEC:</i>	International Electrotechnical Commission
<i>LWA:</i>	The A-weighted sound power level
<i>MSDS:</i>	Material Safety Data Sheet. To qualify as suitable, MSDS and information therein must not be more than 5-years old
<i>Single-speed:</i>	The motor operates at a fixed rotational speed, without variable speed control.
<i>Technical Cycle:</i>	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
<i>Three-phase:</i>	The motor is powered by a three-phase electrical supply, which is standard for industrial and commercial motors due to its efficiency and power delivery.
<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>Three-phase:</i>	The motor is powered by a three-phase electrical supply, which is standard for industrial and commercial motors due to its efficiency and power delivery.

**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 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 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 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.

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 AHUs incorporated design for disassembly features, specifically meeting the following requirements:

- The blowers and motors shall be demountable from enclosure for cleaning, repair, replacement or maintenance purpose; and
- Fan impeller scroll casing shall be removable for fan blades cleaning.

#### Verification

Documentation including but not limited to product label, product catalogue, 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 organisational policy or other equivalent documents.

### **4.3.3 Water Management**

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

*The Applicant 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 Applicant 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 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, CO<sub>2</sub> 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 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.*

#### 4.4.3.1 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.
- Limit the concentration of 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

##### Requirements

10 Basic Points shall be awarded for products not exceeding the maximum noise airborne sound pressure levels as stated in GB/T 14294-2008 (or latest version); other related testing methods are also acceptable with justification provided by the applicant.

*Table 2: Maximum Sound Pressure Noise Level dB(A) -Airborne*

Rated air flow rate (m <sup>3</sup> /hr)	Total static pressure/Pa				
	350	500	750	1,000	1,500
2,000-3,000	60	63	66	69	72
5,000	62	65	68	71	74
6,000	63	66	69	72	75
10,000	65	68	71	74	77
12,000	66	69	72	75	78

Rated air flow rate (m <sup>3</sup> /hr)	Total static pressure/Pa				
	350	500	750	1,000	1,500
20,000	68	71	74	77	80
25,000	69	72	75	78	81
30,000	70	73	76	79	82
50,000	72	75	78	81	84
80,000	74	77	80	83	86
100,000	75	78	81	84	87
160,000	77	80	83	86	89
200,000	78	81	84	87	90

*Note: The value between air flow rate and total static pressure specified in the table may be determined according to interpolation method.*

GB/T 14294-2008 specifies the material requirements, performance, functionality and testing methods related to air handling units.

#### Verification

Documentation including but not limited to product catalogue and test report(s).

## 4.5 PERFORMANCE

### 4.5.1 Efficiency Metrics

*The Applicant can achieve maximum 40 Points under this section.*

*The Applicant is required to achieve 30 Basic Points under this section. Additionally, the Applicant can achieve maximum 10 Bonus Points under this section.*

#### 4.5.1.1 Fan Efficiency – Core Criteria

##### Requirements

- The fan operating efficiency at all intended operating points shall not be less than 15 percentage point below the fan peak total efficiency as required in AMCA 205-12.
- Products shall use forward or backward curved fan with air foil blades.
- Points are awarded for demonstrating compliance of Fan Efficiency Grade (FEG) as listed in Table 3.

*Table 3: Fan Efficiency Grades*

Points	Efficiency Grade
15 Basic	> FEG67
15 Basic + 5 Bonus	> FEG80

AMCA 205 defines the energy efficiency classification for fans.

#### Verification

Documentation including but not limited to product catalogue and test report(s).

### **4.5.1.2 Motor Efficiency – Core Criteria**

#### Requirements

Motors used for the fan in the AHU shall satisfy the efficiency classification in IEC 60034-30-1. Points are awarded for demonstrating compliance of motor efficiency class as per Table 4.

*Table 4: Motor efficiency class*

Points	Efficiency Class
15 Basic	IE3
15 Basic + 5 Bonus	IE4

IEC 60034-30 specifies energy-efficiency classes for single-speed, continuous duty, three-phase, cage-induction motors.

#### Verification

Documentation including but not limited to product catalogue and test report(s).

### **4.5.2 System Performance and Reliability**

*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.*

#### **4.5.2.1 Casing Performance – Core Criteria**

#### Requirements

5 Basic Points are awarded if all products meet the 5 basic requirements of casing performance as listed in Table 5.

Additionally, 5 Bonus Points are awarded if 3 out of 5 bonus criteria are met.

The requirements are in accordance with BS Standard including but not limited to the BS EN 1886:2007 (or latest version). Other related standards are also acceptable with justification provided by the applicant.

*Table 5: Casing Performance*

Points	Criteria	Category
Basic	Class D2: Maximum relative deflection: 10mm/m	Mechanical Strength
	Maximum leakage rate ( $f_{400}$ ): 0.44 l/s/m <sup>2</sup>	Air Leakage Class L2
	Maximum leakage rate ( $f_{700}$ ): 0.63 l/s/m <sup>2</sup>	
	Class T2: $0.5 < U \leq 1.0$	Thermal Transmittance U W/(m <sup>2</sup> K)
	Class TB2: $0.60 < k_b \leq 0.75$	Thermal bridging factor $k_b$
	Minimum sound insertion loss through panels at 1K Hz: 10dB	Acoustic insulation
Bonus	Class D1: Maximum relative deflection: 4 mm/m	Mechanical Strength
	Maximum leakage rate ( $f_{400}$ ): 0.15 l/s/m <sup>2</sup>	Air Leakage Class L1
	Maximum leakage rate ( $f_{700}$ ): 0.22 l/s/m <sup>2</sup>	
	Class T1: $U \leq 0.5$	Thermal Transmittance U W/(m <sup>2</sup> K)
	Class TB1: $0.75 < k_b < 1.00$	Thermal bridging factor $k_b$
	Class F9: Maximum filter bypass leakage rate 0.5%	Filter bypass leakage

BS EN 1886:2025 specifies laboratory test methods, test requirements and classifications for the casings of non-residential air handling units (AHU).

#### Verification

Documentation including but not limited to product catalogue and test report(s).

#### **4.5.2.2 Heat Recovery – Non-core Criteria**

##### Requirements

5 Bonus Points are awarded if all heat exchangers are fitted with seals to minimise air leakage. The heat recovery classes at balanced mass flow conditions (1:1) shall fulfil the following requirements of on thermal energy transfer efficiency,  $\eta_{e\ 1:1\ min} [\%] \geq 71$  with  $\eta_e$  values based on calculation according to EN 13053:2019 or equivalent.

BS EN 13053:2019 specifies requirements and testing for ratings and performance of air handling units as a whole. It also specifies requirements, recommendations, classification, and testing of specific components and sections of air handling units.

##### Verification

Documentation including but not limited to product catalogue and test report(s).

## **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 are awarded 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 optimise performance.

Examples include the following:

- Multi-trade Integrated MEP (MiMEP)
- Smart Controls and Automation
- IoT Integration and Data Analytics
- Energy-Efficient Designs

#### 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 6: 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	-	SS 5
Performance	Efficiency Metrics	Fan Efficiency [CORE]	15	+5	EU 2 / EU 3
		Motor Efficiency [CORE]	15	+5	
	System Performance and Reliability	Casing Performance [CORE]	5	+5	
		Heat Recovery	-	+5	
InnoSmart	Innovations & Additions		-	+5	IA
<b>Total:</b>			<b>50</b>	<b>+90</b>	

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

- SS 5: Noise Control for Building Equipment
- EU 2: Reduction of CO<sub>2</sub> Emissions
- EU 3: Peak Electricity Demand Reduction
- MW 9: Use of Green Products
- Innovations and Additions