CONSTRUCTION INDUSTRY COUNCIL
建造業議會

CONSTRUCTION INDUSTRY COUNCIL

CIC GREEN PRODUCT CERTIFICATION

Assessment Standard

Glazing

CIC GREEN
PRODUCT CERTIFICATION

(Version 2.0)

GLAZING

Summary of Assessment Criteria

CORE CRITERIA

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<tr><td>Product Information</td><td>Product Information:
Provide following information with delivered products or made accessible to public:
• Country of origin
• Information on external reflectance, U-value, shading coefficient / solar heat gain coefficient and visible light transmittance
• Instructions on how the product shall be installed
• Instructions for recommended storage and maintenance for the product
• Instructions for treatment at the end of service life</td><td>Documentation including but not limited to product catalogue, technical datasheet, webpages</td><td>5</td><td>-</td><td>4.1.1</td></tr>
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<tr><td>Thermal Insulation Performance:
The U-value (W/m^{2}K) of the product shall meet:
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The performance of the product shall meet:
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<tr><th>Basic</th><th>+Bonus</th></tr>
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The performance of the product shall meet:
<table><tr><th></th><th>10 [basic]</th><th>+5 [bonus]</th></tr><tr><td>VLT</td><td>≥ 40%</td><td>≥ 70%</td></tr></table></td><td>Laboratory test report(s)</td><td>10</td><td>+5</td><td>4.5.1.4</td></tr>
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NON-CORE CRITERIA

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<tr><td colspan="5">CARBON</td></tr>
<tr><td>CFP quantification</td><td>Provide a life cycle assessment report with the carbon footprint of products (CFP) in $kgCO_{2e}/t$ of product, covering at least A1 to A3 and meet the following.
For Annealed Glass:<table><tr><th></th><th>CFP</th></tr><tr><td>+25 [Bonus]</td><td>≤ 1,023</td></tr><tr><td>+20 [Bonus]</td><td>1,024 – 1,242</td></tr><tr><td>+15 [Bonus]</td><td>1,243 – 1,461</td></tr><tr><td>+10 [Bonus]</td><td>1,462 – 1,680</td></tr><tr><td>+5 [Bonus]</td><td>≥ 1,681</td></tr></table>For Processed Glass:<table><tr><th></th><th>CFP</th></tr><tr><td>+25 [Bonus]</td><td>≤ 1,786</td></tr><tr><td>+20 [Bonus]</td><td>1,787 – 2,169</td></tr><tr><td>+15 [Bonus]</td><td>2,170 – 2,551</td></tr><tr><td>+10 [Bonus]</td><td>2,552 – 2,934</td></tr><tr><td>+5 [Bonus]</td><td>≥ 2,935</td></tr></table></td><td>CFP quantification report

OR

Environmental Product Declaration (EPD)</td><td>+5/
+10/
+15/
+20/
+25</td><td>4.2.1.1</td></tr>
<tr><td colspan="5">RESOURCE</td></tr>
<tr><td rowspan="2">Material Optimization</td><td>Raw Material:
Adopt recycled materials, achieving minimum 15%, by weight, of the final product.</td><td>Material summary report</td><td>+5</td><td>4.3.1.1</td></tr>
<tr><td>Raw Material Utilization Rate: Achieve raw material utilization rate of not less than 85%, by volume or by weight. The utilization rate of raw glass is the ratio of qualified products produced to the raw glass used for manufacturer.</td><td>Material summary report</td><td>+5</td><td>4.3.1.2</td></tr>
<tr><td>Circularity</td><td>Recyclability:
Developed a recycling plan for the product and declared options for reuse, recycling, recovery and disposal. The plan shall include the following and made available to public.</td><td>Recycling plan</td><td>+5</td><td>4.3.2.1</td></tr>
</table>

Criteria	Requirements	Verification	Points +Bonus	Index
	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	4.3.2.2
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 programme	+5	4.3.3.1
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	4.3.4.1
	Water Recycling Program: Develop and implement water recycling program during the manufacturing process.	Documentation on water recycling		4.3.4.2
	Option B: Water Management System: Process valid certificate under ISO 14046: Water Footprint Assessment	ISO 14046 Certificate issued by accredited certification body		4.3.4.3
Energy Management	Energy Management System: Possess valid certificate under ISO 50001: Energy management systems.	ISO 50001 Certificate issued by accredited certification body	+10	4.3.5.2
	Clean Energy: Procure or produce renewable electricity or carbon offsets to compensate 5% of total electricity used and greenhouse gas emissions from other energy sources	Calculation report	+5	4.3.5.3
ENVIRONMENT				
Environmental Management	Environmental Management System: Possess valid certificate under 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

Criteria	Requirements	Verification	Points +Bonus	Index
Regional Product	Regional Product: 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	+5	4.4.2.1
Human Toxicity and Ecosystem Impact	Hazardous Substances: **All Glazing Products:** No carcinogenic substances; No fatal, harmful or toxic substances; No organotin compounds, phthalates or PBDEs. **Tinted glazing products only:** Products shall not contain heavy metals **Double or triple glazing products only:** No filer gas with GWP_{100} > 5 shall be used	Laboratory test report(s) or self-declaration letter	+10	4.4.3.1
PERFORMANCE				
Product Life	Serviceability: Fulfil the quality, safety, air leakage and other functional requirements; *AND* Provide a 10-year guarantee to the product	Laboratory test report(s) and performance test	+5	4.5.2.1
INNOSMART				
Innovations & Additions	Adopt new practice, technology and strategy; OR Achieve exemplary performance	Narrative with supporting	+5	4.6.1
		Subtotal:	+105	

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1. INTRODUCTION

1.1 PURPOSE

The CIC Green Product Certification Scheme (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 label 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.

1.2 BACKGROUND

Glazing products are commonly used building material for fixed and opening windows, window doors, curtain walls and other elements of the building envelop. The glazing area of a building could account for 10 to 25% of a building's exposed surface, serving as an interface to transmit light and provide outdoor view. Common types of glazing being used in architectural applications include clear and tinted float glass, tempered glass, laminated glass as well as a variety of coated glasses, etc. Many of them contain substances that may be harmful to the environment and human health. The most significant environmental impact of glazing products arises from energy losses during the building operation stage, attributable to their extended technical service life.

The purposes of the assessment criteria developed for glazing are, therefore, to promote the use of energy-efficient building envelop, and to minimise the environmental impact through stringent assessment criteria on the production process and use of materials.

2. SCOPE

The scope of this Standard is applicable to glass in fixed and opening windows, window doors, and other elements of building envelop. The glazing types include insulating glass unit (IGU), low-E glass, laminated glass, fire-rated glass, decorative glass and fritted glass etc. Glass blocks and bricks or glass used for internal partitions are excluded from this Standard. The façade unit and integrated building windows and doors are excluded from this Standard.

Note:

Each application should specify the type (i.e. single / double glazing etc.) and product series. ONE application is for ONE product series with same type of glazing only.

3. DEFINITIONS

Applicant:	Organisations which apply for the label of the CIC Green Product Certification of the Construction Industry Council
ASTM:	American Society for Testing and Materials
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.
BS:	British Standards
CCA:	Certified Carbon Auditor
CIC:	Construction Industry Council
CNAS:	China National Accreditation Service for Conformity Assessment

Double or triple glazing:	Windows that have two or three layers of glass to enhance the insulation or to reduce noise from outside
EMAS:	Eco-Management and Audit Scheme (EMAS) is an environmental management tool which enables organisations to assess, manage and continuously improve their environmental performance.
External reflectance:	The percentage of daylight reflected from external surface of the glazing
Glazing:	A part of the façade or window which is made of glass, and it could be transparent or semi-transparent to solar radiation
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
NFCR:	National Fenestration Certification Registry
Post-consumer recycled content	Consumer waste, generated by end-users and can no longer be used for its intended purpose. Examples include construction and demolition debris, materials collected through recycling programs, discarded products (e.g., furniture, cabinetry, decking), and landscaping waste (e.g., leaves, grass clippings, tree trimmings).
Pre-consumer recycled content	Recycled content comes from process waste that is used to make a different product.
Shading coefficient (SC):	The ratio of solar heat gain through a specific unit assembly of glass to the solar heat gain through a standard 3mm clear float glass under the same condition
Single glazing:	Windows that are made up of a single sheet of glass
Solar heat gain coefficient (SHGC):	The fraction of solar heat gain entering the space through the glazing product, expressed as a value between 0 and 1
Standard single glazing:	Standard single glazing refers to 3mm clear float glass

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
U-value:	Overall heat transferred due to conduction, convection and long wave infra-red radiation, defined as heat flow per square metre (m^2) divided by the temperature difference (K), expressed in units of W/m^2K
Visible light transmittance (VLT):	The fraction of total visible light that transmits from the glazing's outdoor side to the indoor side. The visible spectrum typically ranges from a wavelength of 0.38 to 0.78 μm.

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) Label under the Scheme. Bonus points may be awarded if the product meets the "Non-core Criteria". "Bronze", "Silver", "Gold" or "Platinum" Label 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 label

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 report and documentation must be valid during the assessment process and labelling period. The validity of all laboratory report and documentation shall be within 5 years from the date of issue. 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
- Instructions on how the product shall be installed, adjusted and protected in a sustainable manner, to prevent energy loss due to poor installation
- Information on external reflectance, U-value, shading coefficient (SC) / solar heat gain coefficient (SHGC) and visible light transmittance
- Instructions describing the recommended storage and maintenance for the product. Care instructions should contain details on how often the product should be checked and maintained, and what surface treatment is recommended
- Details of what should be done with the product at the end of its service life

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 25 Bonus Points under this section.

Requirements

Provide a life cycle assessment report for quantification and reporting of the carbon footprint of products (CFP), in accordance with ISO 14067:2018. The system boundary of the CFP shall cover at least A1 (raw material supply), A2 (transport) and A3 (manufacturing process).

OR

Provide the product's CFP value from a product-level EPD issued in accordance with BS EN 15804:2012+A2:2019, BS EN 17074:2019, ISO 14025:2006 or ISO 21930:2017. The EPD shall demonstrate the GHG emission covering product stage A1-A3 (Cradle-to-gate).

Points are awarded according to achieved CFP benchmark as listed in Table 2.

Table 2: CFP Benchmark for Glazing Product under the CIC Green Product Certification

Points	**CFP** (kg CO_{2e}/t of product)	
	Annealed Glass	**Processed Glass**
+25 Bonus	≤ 1,023	≤ 1,786
+20 Bonus	1,024 – 1,242	1,787 – 2,169
+15 Bonus	1,243 – 1,461	2,170 – 2,551
+10 Bonus	1,462 – 1,680	2,552 – 2,934
+5 Bonus	≥ 1,681	≥ 2,935

The goal of carrying out a CFP study is to calculate the GHGs generated from the production of glazing in terms of CO_2 equivalents (CO_{2e}). Under Kyoto Protocol, seven types of GHGs are identified to have direct impact on global warming, namely, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF_6) and nitrogen trifluoride (NF_3) (United Nations, 2012).

The CFP study should be conducted on a per-product basis. The functional unit of the CFP Study is defined as 1 ton of the glazing product and the CFP shall be reported in $kgCO2_e$.

The CFP Study shall capture the product stage A1-A3 (Cradle-to-gate) as defined in ISO 14067:2018, ISO 21930:2017, GB/T 24067-2024 , BS EN 17074:2019 and BS EN 15804:2012. Figure 1 below illustrates the major process of glazing product manufacture covered under A1-A3.

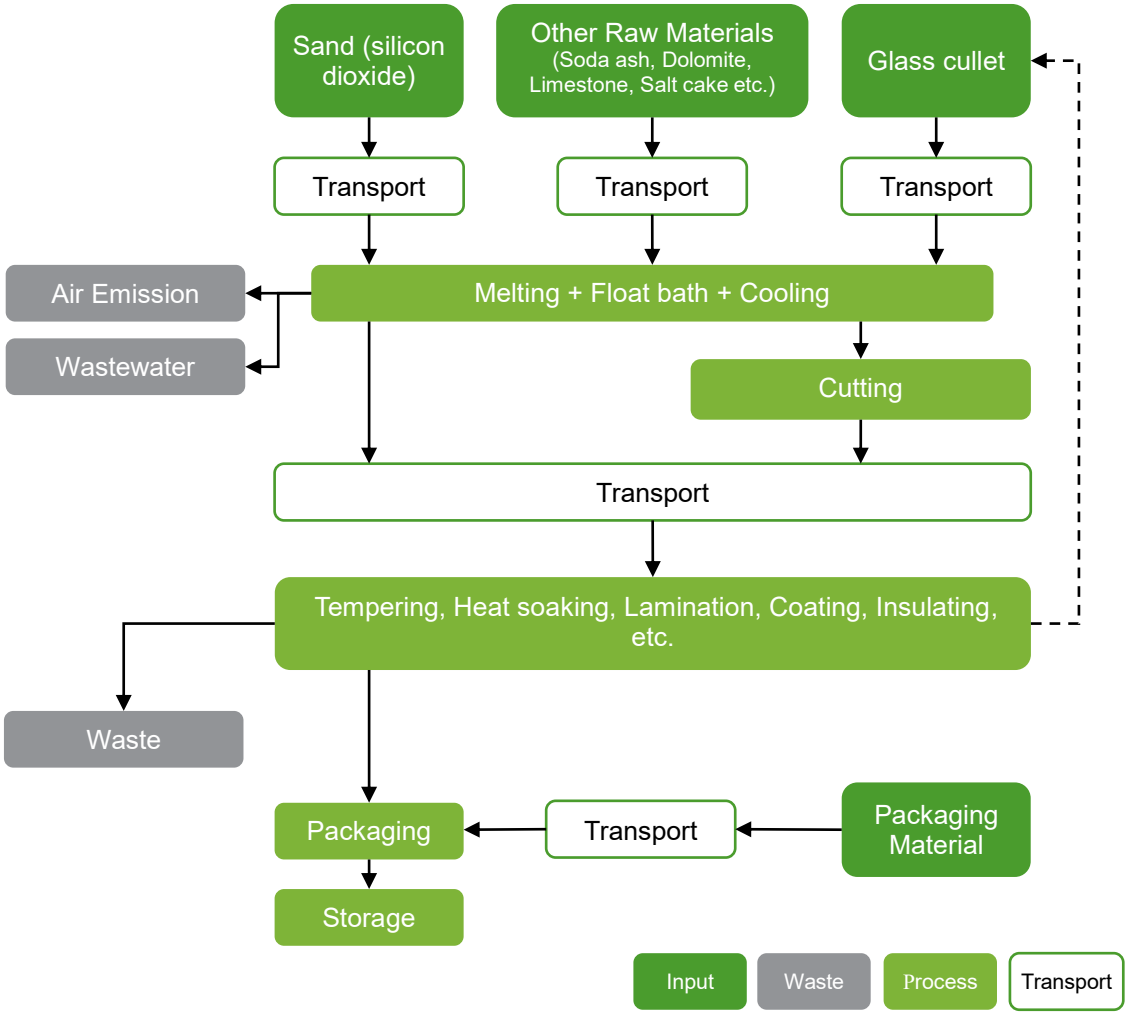

Figure 1 CFP System boundary

Verification:

Either of the following documents shall be provided for verification.

- CFP quantification report endorsed by CCA, in accordance with ISO 14067:2018

OR

- Environmental Product Declaration (EPD) in accordance with ISO 14025:2006, ISO 14067:2018, ISO 21930:2017, GB/T 24067-2024, BS EN 15804:2012 or BS EN 17074:2019.

4.3 RESOURCE

4.3.1 Material Optimization

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

4.3.1.1 Raw Material – Non-core Criteria

Requirements

5 Bonus Points for adopting recycled materials, achieving minimum 10%, by weight, of the final product.

The percentage of recycled materials is calculated according to equation below.

$$\%\ of\ Recycled\ Materials = \frac{Recycled\ Content\ (kg)}{Weight\ of\ Product\ (kg)} \times 100\%$$

Recycled content is the sum of both pre-consumer recycled contents and post-consumer recycled content.

Verification

Material summary with detailed breakdown of the raw materials used in the manufacture process. The summary shall include at least the following information:

- Material type with quantity
- Source of recycled content, support by purchase order, declaration letter from suppliers or other equivalent documents
- Calculation of recycled materials percentage

4.3.1.2 Raw Material Utilization Rate – Non-core Criteria

Requirements

5 Bonus Points for achieving the raw glass material utilization rate of not less than 85%, by volume or by weight.

The aim of this criteria is to promote minimal waste for raw materials during the production process. The raw material utilization rate is defined as the ratio of qualified products raw glass used over the qualified products, defined as equation below.

$$K_C = \frac{A_P}{A_T} \times 100\%$$

Where

K_C = Utilization rate of raw glass

A_P = Total amount of raw glass consumed by the manufacturer during the statistical period, measured in m^3 or t

A_T = Total amount of qualified products produced by the enterprise during the statistical period, measured in m^3 or t

The data shall be calculated over a statistical period of 12 months. If the manufacturer has not been in operation for 12 months, the period can be appropriately shortened but should not be less than 6 months.

Verification

Material summary with detailed breakdown of the raw materials used in the manufacture process. The summary shall include at least the following information:

- Quantity and source of raw glass materials, support by purchase order, declaration letter from suppliers or other equivalent documents
- Quantity of qualified products produced support by manufacturing record or other equivalent documents
- Calculation of utilization rate of raw glass

4.3.2 Circularity

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

4.3.2.1 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 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.
- Identify potential partners for product reuse, recycling, recovery in accordance with the intended cycling pathway(s).
- 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).
- 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.

4.3.2.2 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.

Verification

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

4.3.3 Waste Management

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

4.3.3.1 Waste Management Plan – Non-core Criteria

Requirements

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

- Initiatives taken to reduce waste generation and improve recovery/recycling of waste
- 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 programme.

4.3.4 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. Each option is eligible for a maximum 10 Bonus Points.

Option A:

4.3.4.1 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, support by water usage data acquired from water meter, water sub-meter, water bill or other equivalent documents.

4.3.4.2 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, support by drawings, water usage data acquired from water sub-meter or other equivalent documents.

Option B:

4.3.4.3 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.

4.3.5 Energy Management

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

4.3.5.1 Energy Management Plan – Core Criteria

Requirements

5 Basic 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

- 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.

4.3.5.2 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.

4.3.5.3 Clean Energy – Non-core Criteria

Requirements

5 Bonus Points for procure or produce renewable electricity or carbon offsets to compensate 5% of total electricity used and greenhouse gas emissions from other energy sources.

The targets can be met via a variety of methods. One or more of the methods listed below may be applied toward achieving the targets.

i) For electricity

- Procure or produce renewable electricity to match 5% of the electricity used, OR
- Purchase carbon offsets to compensate for 5% of the resulting greenhouse gas emissions (using grid average emissions factors)

ii) For greenhouse gas emissions from other energy sources

- Purchase carbon offsets to compensate for 5% of the resulting greenhouse gas emissions

Verification

Calculation report include at least the following information:

- Quantity of electricity consumed with the associated carbon emission factor, supported by electricity bill and grid emission factor

- Quantify of other energy source consumed with the associated carbon emission factor, support by purchase order, declaration letter or other equivalent documents
- Quantity of renewable electricity produced onsite, supported by drawings, submeter reading or other equivalent documents
- Quantity of renewable electricity or carbon offset purchased, support by purchase agreement, carbon offset program certification or other equivalent documents

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 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 Product – 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 10 Bonus Points under this section.

4.4.3.1 Hazardous Substances – Non-core Criteria

Requirements

10 Bonus Points for demonstrating the following

i) All glazing products

The product shall not contain any carcinogenic substances or chemicals that are classified as Group 1, 2A or 2B according to International Agency for Research on Cancer (IARC)1. Any such carcinogens which are known to be present as contaminants shall be less than 0.1% by weight of the product.

The product shall also not contain any substances or chemicals that are classified as H300 - Fatal if swallowed, H301 - Toxic if swallowed, H302 - Harmful if swallowed, H310 - Fatal in contact with skin, H311 - Toxic in contact with skin, H312 - Harmful in contact with skin, H330 - Fatal if inhaled, H331 - Toxic if inhaled, H332 - Harmful if inhaled, in accordance with Regulation (EC) No 1272/2008 of the European Parliament and of the Council[2].

The product shall not contain organotin compounds, phthalates or polybrominated diphenyl ethers (PBDEs).

ii) Tinted glazing products only

The product shall not contain toxic heavy metals, or ingredients containing heavy metals, including lead (Pb), cadmium (Cd), mercury (Hg), chromium (Cr), arsenic (As), selenium (Se), antimony (Sb) and cobalt (Co).

iii) Double or triple glazing products only

The product shall not contain chlorinated / brominated paraffins, and filler gases with 100-year global warming potential (GWP_{100}) > 5 shall not be used in the insulating units.

Verification

Laboratory test report(s) or self-declaration letter to demonstrate the compliance with the criteria mentioned above.

[1] Agents Classified by the IARC Monographs, Volumes 1–137 – IARC Monographs on the Identification of Carcinogenic Hazards to Humans
[2] Regulation - 1272/2008 - EN - clp regulation - EUR-Lex

4.5 PERFORMANCE

4.5.1 Performance Property

The Applicant is required to achieve 40 Basic Points under this section. Additionally, the Applicant can achieve maximum 30 Bonus Points under this section.

4.5.1.1 External Reflectance – Core Criteria

Requirements

10 Basic Points for limiting external reflectance on glazing product to be less than 20%.

Verification

Laboratory test report(s) on external reflectance by accredited laboratories in accordance with ASTM E903: Standard Test Method for Solar Absorptance, Reflectance, and Transmittance of Materials Using Integrating Spheres.

4.5.1.2 Thermal Insulation Performance – Core Criteria

Requirements

Points are awarded for demonstrating compliance of U-Value as listed in Table 3

Table 3: Limits of U-value for single, double or tripled glazing product

Points	**U- value** (W/m^2K)	
	Single Glazing	**Double / Triple Glazing**
5 Basic	≤ 5.8	≤ 3.3
5 Basic + 5 Bonus	≤ 3.7	≤ 1.3

The overall heat transfer coefficient or U-value measures how well a glazing product transfer heat. A low U-value indicates the glazing product is well insulated, resulting in a reduction of cooling load.

Verification

Laboratory test report(s) on U-value of the glazing product by accredited laboratories in accordance with following standards, whichever is applicable.

- ISO 8990: Thermal insulation – Determination of steady-state thermal transmission properties – Calibrated and guarded hot box
- ISO 12567: Thermal performance of windows and doors – Determination of thermal transmittance by the hot-box method, whichever is applicable.

OR

Report showing calculation of U-value in accordance with following standards, whichever is applicable.

- EN 673: Glass in building – Determination of thermal transmittance (U-value) – Calculation method
- NFCR 100: Procedure for Determining Fenestration Product U-factors, whichever is applicable

4.5.1.3 Shading Coefficient – Core Criteria

Requirements

Points are awarded for demonstrating compliance of shading coefficient (SC) or solar heat gain coefficient (SHGC) as listed in Table 4.

Table 4: Limits of shading coefficient and solar heat gain coefficient

Points	Shading coefficient (SC)	Solar heat gain coefficient (SHGC)
15 Basic	≤ 0.46	≤ 0.40
15 Basic + 5 Bonus	≤ 0.34	≤ 0.30
15 Basic + 10 Bonus	≤ 0.23	≤ 0.20

Shading coefficient (SC) and solar heat gain coefficient **(**SHGC) measures how well a product blocks heat caused by sunlight. The lower the SC or SHGC value, the less solar heat is transmitted into a building. These two coefficients can be converted according to the equation below:

$$SHGC = SC \times 0.87$$

Verification

Laboratory test report(s) on SC or SHGC of the glazing product by accredited laboratories in accordance with following standards, whichever is applicable.

- ASTM E903: Standard Test Method for Solar Absorptance, Reflectance, and Transmittance of Materials Using Integrating Spheres
- EN 410: Glass in building – Determination of luminous and solar characteristics of glazing
- ISO 9050: Glass in building – Determination of light transmittance, solar direct transmittance, total solar energy transmittance, ultraviolet transmittance and related glazing factors
- NFRC 200: Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence, whichever is applicable.

4.5.1.4 Visible Light Transmittance – Core Criteria

Requirements

Points are awarded for demonstrating compliance of visible light transmittance (VLT) as listed in Table 5.

Table 5: Limits of visible light transmittance

Points	Visible light transmittance (VLT)
10 Basic	≥ 40%
10 Basic + 5 Bonus	≥ 70%

Visible light transmittance (VLT) is an optical property which indicates the amount of visible light transmitted through the glass.

Verification

Laboratory test report(s) on VLT of the glazing product by accredited laboratories in accordance with following standards, whichever is applicable.

- ASTM E903: Standard Test Method for Solar Absorptance, Reflectance, and Transmittance of Materials Using Integrating Spheres
- EN 410: Glass in building – Determination of luminous and solar characteristics of glazing
- ISO 9050: Glass in building – Determination of light transmittance, solar direct transmittance, total solar energy transmittance, ultraviolet transmittance and related glazing factors
- NFRC 200: Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence, whichever is applicable.

4.5.2 Product Life

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

4.5.2.1 Serviceability – Non-core Criteria

Requirements

5 Bonus Points for products fulfilling the quality, safety, air leakage and other functional requirements according to the British Standards (BS), BS EN (European Standard), American Society for Testing and Materials (ASTM), Chinese National Standard (GB) or other equivalent national standards.

AND

Providing 10-year guarantee covering functions and quality according to relevant standards.

The serviceability of glazing product should meet the lowest requirement of the following standards, whichever is applicable.

Table 6: Standards for Glazing

Testing items	Standards
Quality Test	• BS EN 952 Glass for glazing. Classification • BS EN 572 Glass in building. Basic soda lime silicate glass products • ASTM C1036 Standard Specification for Flat Glass • ASTM C1048 Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass • ASTM C1376 Standard Specification for Pyrolytic and Vacuum Deposition Coatings on Flat Glass • ASTM C1172 Standard Specification for Laminated Architectural Flat Glass • ASTM E1300 Standard Practice for Determining Load Resistance of Glass in Building • JGJ 113-2015 Technical specification for application of architectural glass
Safety Test	• BS 6262 Code of Practice for Glazing for Buildings • GB 15762.2-2005 Safety glazing materials in building-Part 2: Tempered glass • GB 15763.3-2009 Safety glazing materials in building-Part 3: Laminated glass
Air Leakage Test	• ASTM E773 Standard Test Method for Accelerated Weathering of Sealed Insulating Glass Units • GB/T 11944-2012 Insulating glass unit
Other Functional Test	• ASTM E774 Standard Specification for the Classification of the Durability of Sealed Insulating Glass Units

Verification

Laboratory test report(s) for relevant quality and performance tests.

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

Demonstrating exemplary performance in any of the existing assessment criteria.

The benefits of environmental performance can be achieved throughout the lifecycle of the products, covering the product, construction process, use and end of life stage. Examples of innovative and smart technologies are shown below.

- Adopt Smart technology at manufacturing facility, such as automation and robotics, to enhance the efficiency of production process.
- Deploy digital platforms to enhance the production, logistics, management of the manufacture, enabling data-driven decision making and optimization.
- Implement systems, such as IoT devices, for real-time hazard detection and monitor the health and safety of workers.
- Reduce Scope 1 carbon emission with process improvements, or carbon capture and utilization technology.
- Enhance the functionality of the product, such as self-cleaning technology, photo-chromic windows

Verification

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

AND

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

5. SCORING

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

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

Label	Evaluation Criteria		Points		Related BEAM Plus Credits
			Basic	+Bonus	
	Product Information [CORE]		5	-	
Carbon	CFP quantification		-	+5/+10/ +15/+20/+25	MW 10
Resources	Material Optimization	Raw Material	-	+5	MW 6
		Raw Material Utilization Rate	-	+5	
	Circularity	Recyclability	-	+5	
		Packaging Requirement	-	+5	
	Waste Management	Waste Management Plan	-	+5	
	Water Management	Water Consumption Reporting	-	+5/+10	
		Water Recycling Program			
		Water Management System			
	Energy Management	Energy Management Plan [CORE]	5	-	
		Energy Management System	-	+10	
		Clean Energy		+5	
Environment	Environmental Management	Environmental Management System	-	+5	
	Regional Product	Regional Product	-	+5	MW 8
	Human Toxicity and Ecosystem Impact	Hazardous Substances	-	+10	
Performance	Performance Property	External Reflectance [CORE]	10	-	SS 8
		Thermal Insulation Performance [CORE]	5	+5	
		Shading Coefficient [CORE]	15	+10	
		Visible Light Transmittance [CORE]	10	+5	
	Product Life	Serviceability	-	+5	
InnoSmart	Innovations & Additions		-	+5	IA
		Total:	**50**	**125**	

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

- SS 8: Urban Heat Island Mitigation
- MW 6: Recycled Materials
- MW 8: Regional Materials
- MW 10: Life Cycle Assessment
- MW 9: Use of Green Products
- Innovations & Additions