CONSTRUCTION INDUSTRY COUNCIL

CIC GREEN PRODUCT CERTIFICATION

Assessment Standard

Technical Requirements

Ceramic Tile

(Version 2)

Ceramic Tile

Summary of Assessment Criteria

CORE CRITERIA

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<tr><th></th><th></th><th></th><th>Basic</th><th>+Bonus</th><th></th></tr>
<tr><td>Product Information</td><td>Provide following information with delivered products or made accessible to public:
• Instructions for use / installation
• Possible toxicity or health hazards imposed by the chemical components
• Methods of cleaning / maintenance</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>
<tr><td colspan="6">ENVIRONMENT</td></tr>
<tr><td rowspan="3">Environmental Management</td><td>Acidification:
Nitrogen oxides (NO_x) and Sulphur dioxides (SO_2) emissions shall not exceed the following limits:
<table><tr><th>Parameter</th><th>Limit (mg/m^3)</th></tr><tr><td>NO_x</td><td>200</td></tr><tr><td>SO_2</td><td>300</td></tr></table></td><td>Testing report(s) of acidifying emissions</td><td>10</td><td>-</td><td>4.4.1.2</td></tr>
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Total particulate matters during the manufacturing process: < 30mg/m^3.</td><td>Detailed report(s) of the air emission of particulate matters</td><td>10</td><td>-</td><td>4.4.1.4</td></tr>
<tr><td>Water Pollutants:
Limit the concentration of pollutants in wastewater discharged below the threshold listed:
• Suspended solids: < 40 mg/L
• Cadmium: < 0.015 mg/L
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• Iron: < 1.5 mg/L
• Lead: < 0.15 mg/L</td><td>Testing report(s) of pollutants concentration in wastewater</td><td>5</td><td>-</td><td>4.4.1.5</td></tr>
<tr><td>Human Toxicity and Ecosystem Impact</td><td>Heavy Metals:
Unglazed tile: Product shall contain < 0.1% (by weight of the product) of heavy metals, including lead (Pb), copper (Cu), cadmium (Cd), mercury (Hg), tin (Sn), hexavalent chromium (Cr(VI)), arsenic (As), and antimony (Sb).</td><td>Laboratory test report(s)</td><td>10</td><td>-</td><td>4.4.3.2</td></tr>
</table>

<table>
<tr><th rowspan="2">Criteria</th><th rowspan="2">Requirements</th><th rowspan="2">Verification</th><th colspan="2">Points</th><th rowspan="2">Index</th></tr>
<tr><th>Basic</th><th>+Bonus</th></tr>
<tr><td rowspan="2"></td><td>Glazed tile: Heavy metals used during the glazing process are exempted subjected to the following limits:

<table><tr><th>Heavy metal</th><th>% by weight of glaze</th><th>Release rate (mg/m^2)</th></tr><tr><td>Lead (Pb)</td><td>< 0.5</td><td>< 80</td></tr><tr><td>Cadmium (Cd)</td><td>< 0.1</td><td>< 7</td></tr><tr><td>Antimony (Sb)</td><td>< 0.25</td><td>N.A.</td></tr></table></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Radioactivity:
External Hazard Index, H_{ex}: ≤ 1.2
Internal Hazard Index, H_{in}: ≤ 0.9</td><td>Laboratory test report(s)</td><td>10</td><td>-</td><td>4.4.3.3</td></tr>
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</table>

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* provide an 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.	Documentation on 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
Waste Management	Waste Management Plan: Implement effective waste management plan detailing the policies, procedures and/or a waste management program covering manufacturing operations.	Waste management plan	+5	4.3.2.1
Water Management	Option A: Water Consumption Reporting: Report both potable and non-potable water usage in the production process of the past year.	Water consumption report	+5/ +10	4.3.3.1
	Water Recycling Program: Develop and implement water recycling program during the manufacturing process.	Documentation on water recycling		4.3.3.2
	Option B: Water Management System: Process valid certificate under ISO 14046: Water Footprint Assessment.	ISO 14046 Certificate issued by accredited certification body		4.3.3.3
Energy Management	Option A: Energy Management Plan: Implement effective energy management policies and procedures and/or an energy management	Energy management plan	+5/ +10	4.3.4.1

Criteria	Requirements	Verification	Points +Bonus	Index
	programme.			
	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
	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 with supporting documents	+5	4.3.4.3
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
	Emission of Fluorides: The emission of fluorides during the firing stage shall not exceed 3 mg/m^3.	Laboratory test report(s)	+10	4.4.1.3
Regional Product	Regional Manufactured 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 with distance between manufacturer and HKSAR	+5	4.4.2.1
Human Toxicity and Ecosystem Impact	Hazardous Substances: Product shall contain < 0.1% by weight of the following: • Materials that give rise to dioxins • Flaming additives for natural products • Halogenated organic solvents • Aniline-based amines • Aziridine or polyaziridines • Alkylphenolethoxylates (APEO) or derivatives (APDs) • 1,3 butadiene • Tar oils (benzo(α)pyrene) • Pentachlorophenol (PCP) • Substances listed in IARC Group 1, 2A and 2B shall be < 0.1% by weight of the product	Laboratory test report(s) or self-declaration letter	+10	4.4.3.1
	Plasticisers: Concentration of phthalate in the product below 0.1% by weight of the product. The limited phthalates include the following types: • Bis(2-ethylhexyl)phthalate (DEHP)	Laboratory test report(s), MSDS and production documentation	+5	4.4.3.4

Criteria	Requirements	Verification	Points +Bonus	Index
	• Dibutyl phthalate (DBP) • Benzylbutyl phthalate (BBP) • Diisononyl phthalate (DINP) • Diisodecyl phthalate (DIDP) • Di-n-octyl phthalate (DNOP)			
	Flame Retardants: Concentration of the following flame retardants in the product shall be below 0.1% by weight of the product: • Polybrominated diphenyl ether (PBDEs) • Polybrominated biphenyls (PBBs) • Short-chained chlorinated paraffin (SCCPs) • Hexabromocyclododecane (HBCD)	Laboratory test report(s) and any relevant production documentation	+5	4.4.3.5
PERFORMANCE				
Product Life	Serviceability: The product shall meet the quality and durability requirements (including abrasion resistance, frost resistance, water absorption, chemical resistance, break strength, stain resistance) according to related standards of International Organization specified in Table 4.	Laboratory test report(s)	+5	4.5.1.1
INNOSMART				
Innovations & Additions	Adopt new practice, technology and strategy; *OR* Achieve exemplary performance.	Narrative with supporting documents	+5	4.6.1
		Subtotal:	+100	

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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

Ceramic tiles are widely used as floor and wall coverings in all types of buildings. While ceramic tiles can be classified into single-fired glazed, double-fired glazed and unglazed (BS EN 14411:2006), their major environmental impacts arise from the energy consumption during the pre-production and firing stages. The operation temperature of the firing process could reach about 1,150 to 1,200°C. Studies found that ceramics are the second highest embodied energy material after concrete, which accounts for 14% of the total embodied energy for buildings. In addition, the manufacturing of ceramic tiles uses different types of chemicals and thus generate significant amount of hazardous pollutants and waste. With an increasing demand for sophisticated ceramic tile products around the globe, higher firing temperatures and more chemicals are required.

The key environmental evaluation criteria should, therefore, be on global warming, human toxicity and acidification. The purposes of the assessment criteria developed for ceramic tiles are indeed to conserve resources and energy consumption, 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 all ceramic tile products applied both to the floor and wall, covering indoor and outdoor spaces, without structural function, defined in accordance with BS EN 14411:2016 *Ceramic tiles – Definitions, Classification, Characteristics, Evaluation of Conformity and Marking*, which includes tiles produced by extrusion and dry-pressing techniques, decorative pieces, trims and mosaics.

Ceramic tiles are classified with respect to shaping (production method) and level of water absorption. The shaping and water absorption level shall be clearly indicated in the application. **ONE** application is only for **ONE** product series with same water absorption ratio (E) as listed, Type 1: $E \leq 0.5\%$; Type 2: $0.5 < E \leq 3\%$; Type: $3 < E \leq 6\%$. All the related products must be listed in the submitted documents. Additives or pigments that could alter the environmental performance of tiles shall also be described in the Application.

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

BS: British Standards

Ceramic tile: A mixture of clays or other inorganic raw materials extruded or pressed into shape and fired at high temperatures to develop the

	required properties. The tile may then be glazed or left unglazed depending on its use
CIC:	Construction Industry Council
CNAS:	China National Accreditation Service for Conformity Assessment
Dry-pressed tile:	A type of tile which is shaped by pressing
EMAS:	Eco-Management and Audit Scheme (EMAS) is an environmental management tool which enables organisations to assess, manage and continuously improve their environmental performance
Extruded tile:	A type of tile which is shaped in an extruder to form its shape which is then cut into tiles of predetermined dimensions
GB:	National Standards of China
Glaze:	A vitrified covering on the tile product
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, MSDS and information therein must not be more than 5-years old
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
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

4. EVALUATION CRITERIA

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

Table 1: Benchmarks for grading

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

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

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

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

4.1 BASIC INFORMATION

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 the following product information on the product packaging, catalogue and/or company website for compliance:

- Instructions for use / installation
- Possible toxicity or health hazards imposed by the chemical components
- Methods of cleaning / maintenance

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 or equivalent.

OR

10 Bonus Points for Providing the product's CFP value from a product level EPD issued in accordance with ISO 14025:2006, ISO 14067:2018, BS EN 15804:2012, ISO 21930:2017, GB/T 24025-2009 or GB/T 24067-2024.

Verification

Either of the following documents shall be provided for verification.

CFP quantification report endorsed by a third-party critical review, in accordance with ISO 14067:2018, GB/T 24067-2024 or equivalent.

OR

Environmental Product Declaration issued by 3rd party fulfilling the above requirements.

4.3 RESOURCE

4.3.1 Circularity

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

4.3.1.1 Recyclability – Non-core Criteria

Requirements

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

- Designate all homogeneous materials in the product as being intended for technical and/or biological cycles and define the intended cycling pathway(s) for each material; and
- Identify potential partners for product reuse, recycling, 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.

Verification

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

4.3.2 Waste Management

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

4.3.2.1 Waste Management Plan – Non-core Criteria

Requirements

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

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

Verification

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

4.3.3 Water Management

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

The Applicants can select one of the options below and comply with any or all the requirements under that option to achieve 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 15 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 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 organisational 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.

4.3.4.3 Clean Energy – Non-core Criteria

Requirements

5 Bonus Points for procurement or production of 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 includes at least the following information:

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

4.4 ENVIRONMENT

4.4.1 Environmental Management

The Applicant can achieve maximum 40 Points under this section.

The Applicant is required to achieve 25 Basic Points under this section. Additionally, the Applicant can achieve maximum 15 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 ISO14001 or EMAS certificate issued by accredited certification body.

4.4.1.2 Acidification – Core criteria

Requirements

10 Basic Points for demonstrating the following:

For the production of ceramic tiles, the Nitrogen oxides (NO_x) and Sulphur dioxides (SO_2) emissions generated from the kilning process shall not exceed the following limits.

Table 2: Limits of nitrogen oxides and sulphur dioxides

Parameter	Limit (mg/m^3)
Nitrogen oxides (NO_x)	200
Sulphur dioxides (SO_2)	300

Verification

Test report(s) of acidifying emissions in accordance with USEPA, EN or ASTM test methods, including but not limited to EN 14791 for sulphur dioxides and EN 14792 for nitrogen oxides test methods. The report shall also include the measures taken to reduce the emissions.

4.4.1.3 Emission of Fluorides – Non-core Criteria

Requirements

10 Bonus Points for the emission of fluorides during the firing stage not exceeding 3 mg/m^3.

Verification

Test report(s) of fluorides emissions in accordance with relevant ISO, USEPA and ASTM test methods, including but not limited to, ISO 15713: stationary source emissions – Sampling and determination of gaseous fluoride content. The report shall also include the measures taken to reduce the emissions.

4.4.1.4 Particulate Matters – Core Criteria

Requirements

10 Basic Points for the air emission of total particulate matters during the manufacturing process not exceeding 30 mg/m^3.

Verification

Detailed report(s) of the air emission of particulate matters shall be compiled according to the National and International test methods, including but not limited to, EN 13284-1. Other related testing methods are also acceptable with justification provided by the Applicant.

4.4.1.5 Water Pollutants – Core Criteria

Requirements

5 Basic Points for limiting the concentration of pollutants in wastewater discharged below the threshold listed below:

- Suspended solids: < 40 mg/L
- Cadmium: < 0.015 mg/L
- Chromium (VI): < 0.15 mg/L
- Iron: < 1.5 mg/L
- Lead: < 0.15 mg/L

Verification

Testing report(s) showing pollutants concentration in wastewater discharged from the manufacturing plant. Test report(s) shall be complied according to the National and International test methods, including but not limited to, ISO 5667-17 or APHA 2540D for suspended solids, ISO 8828 for cadmium, ISO 11083 for hexavalent chromium, ISO 6332 for iron, and ISO 8288 for lead.

4.4.2 Regional Product

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

4.4.2.1 Regional Manufactured 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 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.

4.4.3.1 Hazardous Substances – Non-core Criteria

Requirements

10 Bonus Points for demonstrating that the products contain < 0.1% by weight of the following:

- Materials that give rise to dioxins
- Flaming additives for natural products
- Halogenated organic solvents
- Aniline-based amines
- Aziridine or polyaziridines
- Alkylphenolethoxylates (APEO) or derivatives (APDs)
- 1,3 butadiene
- Tar oils (benzo(α)pyrene)
- Pentachlorophenol (PCP)
- Any carcinogenic substances or chemicals that are classified as Group 1, 2A or 2B according to International Agency for Research on Cancer (IARC)[1]

Verification

Laboratory test report(s) or self-declaration letter. The test shall be performed in accordance with relevant international standards.

4.4.3.2 Heavy Metals – Core Criteria

Requirements

10 Basic Points for demonstrating the following:

The unglazed tile products shall contain less than 0.1% (by weight of the product) of heavy metals, including lead (Pb), copper (Cu), cadmium (Cd), mercury (Hg), tin (Sn), hexavalent chromium (Cr(VI)), arsenic (As), and antimony (Sb).

Lead, cadmium or antimony can be used in additives for glazing if the total content or release rates of these heavy metals are within the limits listed in Table 3.

Table 3: Limits of heavy metals for glazing

Heavy metal	% by weight of glaze	Release rate (mg/m^2)
Lead (Pb)	< 0.5	< 80
Cadmium (Cd)	< 0.1	< 7

[1] Agents Classified by the IARC Monographs, Volumes 1–137 – IARC Monographs on the Identification of Carcinogenic Hazards to Humans

Antimony (Sb)	< 0.25	N.A.

Verification

Laboratory test report(s) to demonstrate the compliance with the criteria mentioned above. Release rate tests shall be compiled according to the National and International test methods, including but not limited to, BS EN ISO 10545-15 or equivalent.

4.4.3.3 Radioactivity – Core Criteria

Requirements

10 Basic Points for demonstrating the following:

The effective concentration of potassium isotope K_{40} (C_K), radium isotope Ra_{226} (C_{Ra}) and thorium isotope Th_{232} (C_{Th}) shall satisfy the following requirements:

External Hazard Index, H_{ex}:

$$H_{ex} = \frac{C_K}{4200} + \frac{C_{Ra}}{370} + \frac{C_{Th}}{260}$$

Internal Hazard Index, H_{in}:

$$H_{in} = \frac{C_{Ra}}{200}$$

where H_{ex} shall be $\leqslant$ 1.2 and H_{in} shall be $\leqslant$ 0.9.

Products shall be tested based on the requirement as stated in GB 6566-2010 (or latest version); other related testing methods are also acceptable with justification provided by the applicant.

GB 6566-2010 specifies the limits and natural radionuclides in building materials radionuclide radium-226, thorium-232, potassium-40 Test Method for radioactivity.

Verification

A detailed laboratory report(s) meeting the above requirements shall be provided.

4.4.3.4 Plasticisers – Non-Core Criteria

Requirements

5 Bonus Points for limiting the concentration of phthalates in the product to be below 0.1% by weight of the product.

The limited phthalates include the following types:

- Bis(2-ethylhexyl)phthalate (DEHP)
- Dibutyl phthalate (DBP)

- Benzylbutyl phthalate (BBP)
- Diisononyl phthalate (DINP)
- Diisodecyl phthalate (DIDP)
- Di-n-octyl phthalate (DNOP)

Verification

Laboratory test report(s) according to the National and International test methods.

4.4.3.5 Flame Retardants – Non-core Criteria

Requirements

5 Bonus Points for demonstrating that concentration of the flame retardants in the product shall be below 0.1% by weight of the product. The restricted flame retardants include the following types:

- Polybrominated diphenyl ether (PBDEs)
- Polybrominated biphenyls (PBBs)
- Short-chained chlorinated paraffin (SCCP)
- Hexabromocyclododecane (HBCD)

Product shall be tested based on applicable requirements such as BS EN 62321:2023 (or later version); other related testing methods are also acceptable with justification provided by the applicant.

Verification

Laboratory test report(s) meeting the above requirements.

4.5 PERFORMANCE

4.5.1 Product Life

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

4.5.1.1 Serviceability – Non-core Criteria

Requirements

5 Bonus Points for demonstrating the following:

The product shall meet the quality and durability requirements (including abrasion resistance, frost resistance, water absorption, chemical resistance, break strength, stain resistance) according to related standards of International Organisation for Standardisation (ISO), American Society for Testing and Materials (ASTM), and Chinese National Standard (GB).

Table 4: Related standards for tests of serviceability

Test	ASTM	ISO	GB
Abrasion Resistance	ASTM C 1027	ISO 10545	GB/T3810, GB/T35610-2017, TCECS 10036-2019
Frost Resistance	ASTM C 1026		
Water Absorption	ASTM C 373		
Chemical Resistance	ASTM C 650		
Break Strength	ASTM C 648		
Stain Resistance	ASTM C 1378		

Verification

Laboratory test report(s) and any production documentation for all relevant quality, durability 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.

Verification

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

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

5. SCORING

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

Table 5: Points to be awarded under the assessment criteria of this Standard

Label	Evaluation Criteria		Points		Related BEAM Plus Credits
			Basic	+Bonus	
	Product Information [CORE]		5	-	
Carbon	CFP Quantification		-	+10	
Resource	Circularity	Recyclability	-	+5	
		Packaging Requirement	-	+5	
	Waste Management	Waste Management Plan	-	+5	
	Water Management	Water Consumption Reporting	-	+5/+10	
		Water Recycling Program			
		Water Management System			
	Energy Management	Energy Management Plan	-	+5/+10	
		Energy Management System			
		Clean Energy	-	+5	
Environment	Environmental Management	Environmental Management System	-	+5	
		Acidification [CORE]	10	-	
		Emission of Fluorides	-	+10	
		Particulate Matters [CORE]	10	-	
		Water Pollutants [CORE]	5	-	
	Regional Product	Regional Manufactured Product	-	+5	MW 8
	Human Toxicity and Ecosystem Impact	Hazardous Substances	-	+10	
		Heavy Metals [CORE]	10	-	
		Radioactivity [CORE]	10	-	
		Plasticisers	-	+5	
		Flame Retardants	-	+5	
Performance	Product Life	Serviceability	-	+5	MW 4
InnoSmart	Innovations & Additions		-	+5	IA
		Total:	**50**	**+100**	

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

- MW 4: Design for Durability and Resilience
- MW 8: Regional Materials
- MW 9: Use of Green Products
- Innovations and Additions