CONSTRUCTION INDUSTRY COUNCIL

CIC GREEN PRODUCT CERTIFICATION

Assessment Standard

Technical Requirements

Plant-Based Fibre Composite

(Version 2)

PLANT-BASED FIBRE COMPOSITE

Summary of Assessment Criteria

CORE CRITERIA

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<tr><td>Product Information</td><td>Provide following information with delivered products or made accessible to public:
● Product Composition
● Possible toxicity or health hazards imposed by the chemical components
● Instructions for installation and maintenance
● Instructions for disposal of the product and packaging</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">RESOURCE</td></tr>
<tr><td>Material Optimization</td><td>Raw Materials:
Composite products must either use raw materials certified by forest management standards (e.g., FSC, PEFC); OR

Adopt recycled contents, natural waste materials or sustainable source, meeting the percentages as listed in Table 2

<table><tr><th rowspan="3">Points</th><th colspan="3">Raw Materials</th></tr><tr><th colspan="1">Option A</th><th colspan="2">Option B</th></tr><tr><th>Sustainable source</th><th>Recycled content</th><th>Natural waste materials</th></tr><tr><td>10 Basic</td><td>≥ 60%</td><td>≥ 80%</td><td>≥ 60%</td></tr><tr><td>10 Basic
+5 Bonus</td><td>≥ 80%</td><td>≥ 90%</td><td>≥ 70%</td></tr></table></td><td>Sustainable source certification.
OR
Detailed report(s) of the recycled content or the source of natural raw materials with relevant substantiations.</td><td>10</td><td>+5</td><td>4.3.1.1</td></tr>
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Binding agents and product shall avoid harmful chemicals as listed in Section 4.4.3.1; (10 basic)
AND
Bonus points are awarded for using natural non-toxic binding agents or physical methods, and for keeping IARC Group 1, 2A, and 2B substances below 0.1% by weight. (+10 bonus)</td><td>Laboratory test report(s), MSDS, self-declaration letter and production documentation</td><td>10</td><td>+5/+10</td><td>4.4.3.1</td></tr>
<tr><td>Heavy Metals:
Mercury (Hg), lead (Pb), cadmium (Cd), hexavalent chromium (Cr(VI)), arsenic</td><td>Laboratory test report(s), self-declaration letter,</td><td>5</td><td>-</td><td>4.4.3.2</td></tr>
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Criteria	Requirements	Verification	Points		Index
			Basic	+Bonus	
	(As), and copper (Cu) shall be contained less than 0.1% by weight of the product.	MSDS and production documentation			
Volatile Organic Compounds (VOC)	Formaldehyde: Option A Formaldehyde emissions from the product must be ≤ 1.0 mg/L (Desiccator Method) or ≤ 0.02 mg/m³ within 48 hours (Chamber Method); *OR* Option B Product shall be formaldehyde-free. AND Binding agent shall contain free formaldehyde ⩽ 0.5 % by weight of the adhesives used.	Laboratory test report(s)	**10**	-	4.4.4.1
	VOC Content: Option A TVOC emissions from the product must be < 0.25 mg/m³ within 24 hours; *OR* Option B Product shall be free of volatile organic compounds.	Laboratory test report(s)	**10**	-	4.4.4.2
		Subtotal:	**50**	+15	

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	4.3.2.1
	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	4.3.2.2
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 plan	+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 a water recycling program during the manufacturing process.	Documentation on water recycling		4.3.4.2
	Option B: Water Management System: Process valid certificates under ISO 14046: Water footprint Assessment.	ISO 14046 Certificate issued by accredited certification body		4.3.4.3
Energy Management	Option A: Energy Management Plan: Implement effective energy management policies and procedures and/or an energy management programme.	Energy Management Plan	+5/ +10	4.3.5.1

Criteria	Requirements	Verification	Points +Bonus	Index
	Option B: Energy Management System: Possess valid certificates under ISO 50001: Energy management systems – Requirements with guidance for use.	ISO 50001 Certificate issued by accredited certification body		4.3.5.2
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
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	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	4.4.3.3
	Preservatives: Preservatives including fungicides, insecticides, tar oil / creosote shall be < 0.1% by weight of the product as prescription constituents	Laboratory test report(s) , self-declaration letter, MSDS and any production documentation	+5	4.4.3.4
PERFORMANCE				
Product Life	Serviceability: Carry out at least FOUR testing items to demonstrate quality, durability and performance properties of the product. Relevant tests include the followings: • Durability • Moisture Resistance • Antimicrobial and Mildew Resistance • Chemical Resistance • Dimensional Stability • Weather Resistance	Laboratory test report(s) and performance test	+5	4.5.1.1

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

1.2 BACKGROUND

Plant-based fibre composite includes a range of plant-based derivative products which are manufactured by binding the strands, particles, fibres, veneers of wood or other plant-based fibre, together with binding agents, to form composite materials. These

products are used in a variety of applications, from domestic and commercial buildings to industrial products. Since plant-based fibre composite products are typically made from recycled and recovered waste wood / fibre, they are environmentally friendly building materials.

The purposes of this Standard for composite wood products are, therefore, to minimise the use and subsequent release of harmful substances to the environment and humans throughout the product's life cycle, to conserve resources and energy, and to reduce the amount of waste disposed in landfills. The development of the criteria includes the research and study on relevant eco-labelling schemes and life cycle assessment (LCA) reports.

2. SCOPE

This Standard applies to plant-based fibre composite panels, including engineered products such as particleboard, fibreboard, hardboard, and panels composed primarily of wood powder or plant fibres (e.g., wood chips, palm, straw, bamboo, bagasse, jute stalks, cotton stalks, seed hulls). The final product must consist of at least 60% wood or plant-based materials by mass.

The types and ratio (formulation) of raw materials shall be specified clearly in each application. **ONE** application is only for **ONE** product series with same raw materials and ratio (formulation). All the related products have to be listed on the submitted documents.

For example, a formulation using Fibre A with Binding Agent B qualifies as one application. Additional applications are allowed for products within the same labelled series that use the same raw materials but different ratios, provided they are submitted within the label's validity period.

3. DEFINITIONS

Applicant:	Organisations which apply for the label of the CIC Green Product Certification of the Construction Industry Council
AFCS:	Australian Forest Certification Scheme. http://www.forestrystandard.org.au/home
ASTM:	American Society for Testing and Materials
BS:	British Standards
CARB:	California Air Resources Board
CCA:	Carbon Credit Accounting
CIC:	Construction Industry Council
CNAS:	China National Accreditation Service for Conformity Assessment

Chamber Method:	Method to test VOC emissions by placing a material inside a sealed chamber with controlled temperature, humidity, and airflow. VOCs released from the material are measured in the chamber air over time to determine emission rates, helping evaluate the material's impact on indoor air quality.
Desiccator Method:	Method to measures the amount of volatile compounds in a sample by heating it to evaporate the VOCs, then cooling it in a desiccator to prevent moisture absorption before weighing. The weight loss after heating and cooling represents the total volatile content, helping to quantify VOC emissions from materials accurately.
EMAS:	Eco-Management and Audit Scheme (EMAS) is an environmental management tool which enables organisations to assess, manage and continuously improve their environmental performance.
FSC:	Forest Stewardship Council. http://ic.fsc.org/
GB:	National Standards of China
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 Organization for Standardisation
MDF and hardboard:	Medium density fibreboard and hardboard are made the same way as particleboard except that the wood particles are further refined into even smaller particles to provide a smooth edge to the panel.
MSDS:	Material Safety Data Sheets. To qualify as suitable, the MSDS and information therein must not be more than 5-year-old.
Particleboard:	Particleboard is made from small wood particles pressed together with glue under extreme heat and pressure to make a solid panel.
PEFC:	Programme for the Endorsement of Forest Certification schemes www.pefc.org/
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.

Raw materials: Materials used in the manufacturing of plant-based fibre composite products.

SFI: Sustainable Forestry Initiative. http://www.sfiprogram.org/

Third-party: An entity without any financial interest or stake in the sales of the product or service being evaluated or other conflict of interest

VOC: Volatile organic compounds. Any organic compound (compound which contains carbon) with either a boiling point below 250°C measured at 101.3 kPa or a vapour pressure of more than 0.1 mm Hg measured at 25°C

Wood waste: Wood waste means sawdust, timber offcuts, wooden crates, wooden packaging, wooden pallets, wood shavings and similar materials, and includes any mixture of those materials, but does not include wood treated with chemicals such as copper chrome arsenate (CCA), high temperature creosote (HTC), pigmented emulsified creosote (PEC) and light organic solvent preservative (LOSP)

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 following information with delivered products or made accessible to public:

- Product Composition
- Possible toxicity or health hazards imposed by the chemical components
- Instructions for installation and maintenance
- Instructions for disposal of the product and packaging

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 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 a third-party fulfilling the above requirements.

4.3 RESOURCE

4.3.1 Material Optimisation

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.

4.3.1.1 Raw Materials – Core Criteria

Requirements

10 Basic Points and 5 Bonus Points for meeting the requirements of raw materials for plant-based fibre composite as below:

Table 2: Requirements of raw materials for plant-based fibre composite and the associated points

Points	**Raw Materials**		
	Option A	***Option B***	
	Sustainable source	**Recycled content**	**Natural waste materials**
10 Basic	≥ 60%	≥ 80%	≥ 60%
10 Basic +5 Bonus	≥ 80%	≥ 90%	≥ 70%

Option A: Sustainable source

The major raw materials of the composite product shall obtain any forest management certification, such as FSC, PEFC, SFI, or AFCS certified fibre; The sustainable source (by weight of product) shall meet the requirement specified in Table 2.

Sustainable source under certification schemes used worldwide are listed above, but other schemes could be also accepted subjected to verification.

OR

Option B: Recycled Content & Natural Waste Material

The major raw materials of the composite product shall be any combination of recycled materials, wood waste, natural fibre materials including palm, straw, bamboo, bagasse, cellulose fibre, seed hull, return fibre (i.e. postconsumer and preconsumer fibre), cotton

fibre, cotton stalks, jute stalks, crop residue or other waste fibre, with not less than the required percentages of recycled content / natural waste content specified in Table 2.

Verification

Option A:
Forest certifications for relevant raw materials and calculations on the percentage of sustainable sourcing.

OR

Option B:
Detailed report(s) of the recycled content or the source of natural raw materials with relevant substantiations.

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 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.

4.3.2.2 Packaging Requirement – Non-core Criteria

Requirements

5 Bonus Points for minimising 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 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.

4.3.4 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 the associated 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, supported 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, supported 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 certificates 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 bodies.

4.3.5 Energy Management

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

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

Option A:

4.3.5.1 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, optimising 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:

4.3.5.2 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 organisations to establish, implement, maintain, and improve an Energy Management System. The goal is to help organisations 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 bodies.

4.4 ENVIRONMENT

4.4.1 Environmental Management

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

4.4.1.1 Environmental Management System – Non-core Criteria

Requirements

5 Bonus Points for possessing valid certificate under ISO 14001: Environmental management systems — Requirements with guidance for use or EU Eco-Management and Audit Scheme (EMAS).

The target of the environmental management system shall be set to reduce the environmental impacts during the manufacturing process which include, but are not limited to, the reduction of hazardous substance emissions, energy consumption, CO_2 emissions, secondary environmental load, waste management, water management, etc.

ISO 14001 is the international standard which provides an outline of how to meet the environmental policy and objectives for the business of the applicant.

Eco-Management and Audit Scheme (EMAS) is an environmental management tool which enables organisations to assess, manage, and continuously improve their environmental performance.

Verification

A valid ISO14001 or EMAS Certificate issued by accredited certification bodies.

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 35 Points under this section.

The Applicant is required to achieve 15 Basic Points under this section. Additionally, the Applicant can achieve maximum 20 Bonus Points under this section.

4.4.3.1 Hazardous Substances – Core Criteria

Requirements

10 Basic Points for meeting the following requirements:

- ***For binding agents:***

  Shall not be formulated with alkylphenol ethoxylates, alkylphenols, aziridine, polyuridines or halogenated solvents.

- ***For plant-based fibre composite product:***

  Boron (B), toluene and xylene shall be contained less than 0.1% by weight of the product.

5 Bonus Points for the use of natural non-toxic binding agents or physical means.

5 more Bonus Points for demonstrating that 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.

Verification

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

4.4.3.2 Heavy Metals – Core Criteria

Requirements

5 Basic Points for limiting concentration of heavy metals below 0.1% by the weight of the product.

- Mercury (Hg)
- Lead (Pb)
- Cadmium (Cd)
- Hexavalent Chromium (Cr(VI))
- Arsenic (As)
- Copper (Cu)

Verification

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

4.4.3.3 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:

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

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

Product shall be tested based on the requirement 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.

4.4.3.4 Preservatives – Non-core Criteria

Requirements

5 Bonus Points for demonstrating that preservatives including fungicides, insecticides, tar oil or creosote shall be < 0.1% by weight of the product as prescription constituents.

Verification

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

4.4.4 Volatile Organic Compounds (VOC)

The Applicant is required to achieve 20 Basic Points under this section.

4.4.4.1 Formaldehyde – Core Criteria

Requirements

10 Basic Points are awarded for meeting one of the following requirements.

- **For plant-based fibre composite product:**

  Option A:

  The formaldehyde emissions from the plant-based composite product shall be below the following limits:

  - $\leqslant$ 1.0 mg/L using the Desiccator Method; or
  - $\leqslant$ 0.02 mg/m^3 within 48 hours[^] using the Chamber Method

  Option B:
  Product shall not contain formaldehyde content.

AND

[^] *The length of testing time is not restricted but depends on the testing standard used.*

- **For Binding agent:**

  Shall contain free formaldehyde $\leqslant$ 0.5 % by weight of the adhesives used.

Verification

Option A

The emission tests in laboratories shall be conducted in accordance to including but not limited to *AS/NZS 4266.16 Reconstituted Wood-based Panels – Methods of Test – Formaldehyde Emission – Desiccator Method* or *ASTM D 5116-10: Standard Guide for Small-Scale Environmental Chamber Determinations of Organic Emissions from Indoor Materials*. Other related testing methods are also acceptable with justification provided by the Applicant.

Option B

Product shall be tested in accordance with *CARB Method 310*. Other related testing methods are also acceptable with justification provided by the Applicant.

4.4.4.2 VOC Content – Core Criteria

Requirements

10 Basic Points for meeting one of the following requirements.

Option A

The emission limit of total volatile organic compounds (TVOC) from the product shall be < 0.25 mg/m^3 within 24 hours.

Option B

Product shall not contain volatile organic compounds content.

Verification

Option A

The emission tests in laboratories shall be conducted in accordance to including but not limited to *AS/NZS 4266.16 Reconstituted Wood-based Panels – Methods of Test – Formaldehyde Emission – Desiccator Method* or *ASTM D 5116-10: Standard Guide for Small-Scale Environmental Chamber Determinations of Organic Emissions from Indoor Materials*. Other related testing methods are also acceptable with justification provided by the Applicant.

Option B

Product shall be tested in accordance with *CARB Method 310*. Other related testing methods are also acceptable with justification provided by the Applicant.

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 product durability, stability, and suitability through at least **FOUR** testing items which may include, but are not limited to, the following:

- Durability
- Moisture Resistance
- Antimicrobial and Mildew Resistance
- Chemical Resistance
- Dimensional Stability
- Weather Resistance

Table 3: Standards for Plant-Based Fibre Composite

Testing items	Standards
Durability	ASTM D1037, GB/T 17657, GB/T 35601-2017, GB/T 35612-2017
Moisture Resistance	ASTM D4442, GB/T 17657, GB/T 35601-2017, GB/T 35612-2017
Antimicrobial and Mildew Resistance	ASTM G21, GB/T 17657, GB/T 35601-2017, GB/T 35612-2017
Chemical Resistance	ASTM D1308, GB/T 17657, GB/T 35601-2017, GB/T 35612-2017
Dimensional Stability	ASTM D1037, GB/T 17657, GB/T 35601-2017, GB/T 35612-2017
Weather Resistance	ASTM D2565, GB/T 17657, GB/T 35601-2017, GB/T 35612-2017

Verification

Laboratory report(s) for all 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.

- Implementing technologies that significantly reduce resource consumption across various aspects.
- Adopting intelligent production methods that leverage automation, data analytics, and innovative design techniques.

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

Including 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 4: 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	Material Optimization	Raw Materials [CORE]	10	+5	MW 6
	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			
Environment	Environmental Management	Environmental Management System	-	+5	
	Regional Product	Regional Manufactured Product	-	+5	MW 8
	Human Toxicity and Ecosystem Impact	Hazardous Substances [CORE]	10	+5/+10	
		Heavy Metals [CORE]	5	-	
		Flame Retardants	-	+5	
		Preservatives	-	+5	
	Volatile Organic Compounds (VOC)	Formaldehyde [CORE]	10	-	
		VOC Content [CORE]	10	-	
Performance	Product Life	Serviceability	-	+5	MW 4
InnoSmart	Innovations & Additions		-	+5	IA
		Total:	**50**	**+90**	

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 6: Recycled Materials
- MW 8: Regional Materials
- MW 9: Use of Green Products
- Innovations and Additions