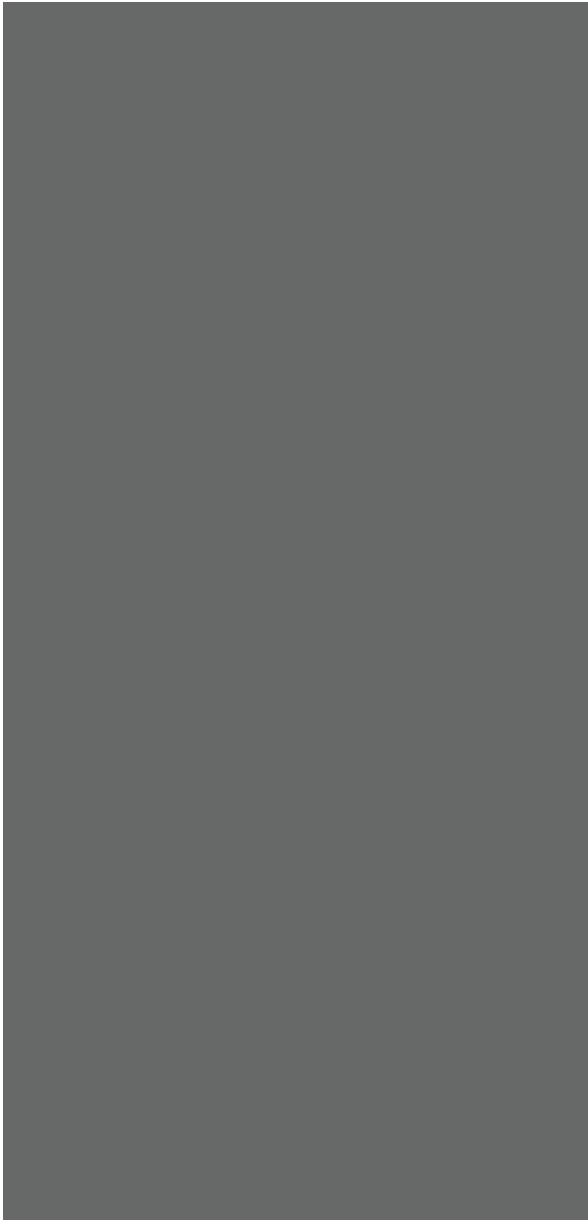


## ENVIRONMENTAL PRODUCT DECLARATION

# DECORATIVE HIGH-PRESSURE LAMINATE (HPL), STANDARD GRADE

SKYDECOR LAMINATES PRIVATE LIMITED

F-26, SECTOR-8, NOIDA, UTTAR PRADESH – 201301, INDIA



Skydecor Laminates Private Limited is committed to responsible manufacturing and transparent environmental stewardship within the decorative surfacing industry. By publishing a third-party verified Environmental Product Declaration (EPD) for its Decorative High-Pressure Laminate (HPL), Skydecor demonstrates leadership in measuring, managing, and disclosing the environmental impacts of its products. The Life Cycle Assessment underlying this EPD follows internationally recognized ISO standards and reflects facility-specific data from Indian operations, ensuring credibility and relevance. Through systematic assessment of raw materials, energy use, transport, and manufacturing processes, Skydecor identifies key impact drivers and opportunities for improvement.

This proactive approach supports green building initiatives, enables informed decision-making for architects and designers, and reinforces Skydecor's long-term commitment to sustainability, accountability, and continuous environmental performance improvement.



using  
for applications



# ENVIRONMENTAL PRODUCT DECLARATION

DECORATIVE HIGH-PRESSURE LAMINATE (HPL), STANDARD GRADE  
DECORATIVE SURFACING MATERIAL FOR INTERIOR FURNITURE AND ARCHITECTURAL  
APPLICATIONS



According to ISO 14025 and  
ISO21930:2017

EPD PROGRAM AND PROGRAM OPERATOR NAME, ADDRESS, LOGO, AND WEBSITE	UL Solutions 333 Pfingsten Rd, Northbrook IL, 60062 <a href="http://www.ul.com">www.ul.com</a> <a href="http://www.spot.ul.com">www.spot.ul.com</a>
GENERAL PROGRAM INSTRUCTIONS AND VERSION NUMBER	Program Operator Rules v 2.7 2022
MANUFACTURER NAME AND ADDRESS	Skydecor Laminates Private Limited F-26, Sector-8, Noida, Uttar Pradesh – 201301, India
DECLARATION NUMBER	4792073977.101.1
DECLARED PRODUCT & FUNCTIONAL UNIT OR DECLARED UNIT	1 m <sup>2</sup> of Decorative High-Pressure Laminate (HPL), 0.77 mm thickness
REFERENCE PCR AND VERSION NUMBER	UL PCR Part B – Structural and Architectural Wood Products (current version)
DESCRIPTION OF PRODUCT APPLICATION/USE	Decorative surfacing material used for interior furniture, cabinetry, wall panels, and architectural applications.
PRODUCT RSL DESCRIPTION (IF APPL.)	Not applicable. This is a product-specific EPD based on manufacturer-specific primary data. Industry-average statistical variability is not reported.
MARKETS OF APPLICABILITY	India and international markets
DATE OF ISSUE	March 16th, 2026
PERIOD OF VALIDITY	5 Years
EPD TYPE	product-specific
RANGE OF DATASET VARIABILITY	[Industry-average only; mean, median, standard deviation]
EPD SCOPE	Cradle-to-gate (Modules A1–A3)
YEAR(S) OF REPORTED PRIMARY DATA	April 2024 – March 2025
LCA SOFTWARE & VERSION NUMBER	(openLCA version 2.6 (GreenDelta GmbH))
LCI DATABASE(S) & VERSION NUMBER	Ecoinvent v3.11 (cut-off system model)
LCIA METHODOLOGY & VERSION NUMBER	TRACI 2.2

The PCR review was conducted by:	UL Solutions
	PCR Review Panel <a href="mailto:epd@ul.com">epd@ul.com</a>
This declaration was independently verified in accordance with ISO 14025: 2006. <input type="checkbox"/> INTERNAL <input checked="" type="checkbox"/> EXTERNAL	Cooper McCollum, UL Solutions 
This life cycle assessment was conducted in accordance with ISO 14044 and the reference PCR by:	Dr Sameeksha Patil, SS Climate Advisors LLP
This life cycle assessment was independently verified in accordance with ISO 14044 and the reference PCR by:	Alena Raymond, PhD, AmSpec Group 

# ENVIRONMENTAL PRODUCT DECLARATION



**DECORATIVE HIGH-PRESSURE LAMINATE (HPL), STANDARD GRADE**  
DECORATIVE SURFACING MATERIAL FOR INTERIOR FURNITURE AND ARCHITECTURE  
APPLICATIONS

**According to ISO 14025,  
and ISO 21930:2017**

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## LIMITATIONS

**Exclusions:** EPDs do not indicate that any environmental or social performance benchmarks are met, and there may be impacts that they do not encompass. LCAs do not typically address the site-specific environmental impacts of raw material extraction, nor are they meant to assess human health toxicity. EPDs can complement but cannot replace tools and certifications that are designed to address these impacts and/or set performance thresholds – e.g. Type 1 certifications, health assessments and declarations, environmental impact assessments, etc. LCIA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins, or risks.

EPDs do not indicate that any environmental or social performance benchmarks are met, and there may be impacts that they do not encompass. LCAs do not typically address site-specific environmental impacts of raw material extraction, nor are they meant to assess human health toxicity.

**Accuracy of Results:** As this is a product-specific EPD based on manufacturer primary data, statistical variability estimation (e.g., mean, median, standard deviation) is not applicable. National or regional life cycle averaged data for raw material extraction do not distinguish between extraction practices at specific sites and can greatly affect the resulting impacts.

While this EPD does not address landscape-level forest management impacts, potential impacts may be addressed through requirements in regional regulatory frameworks, ASTM 7612-15 guidance, and ISO 21930 Section 7.2.11 including notes therein. While this EPD does not address all forest management activities that influence forest carbon, wildlife habitat, endangered species, and soil and water quality, these potential impacts may be addressed through other mechanisms such as regulatory frameworks and/or forest certification systems which, combined with this EPD, will give a more complete picture of environmental and social performance of wood products.

**Comparability:** EPDs from different programs may not be comparable. Full conformance with a PCR allows EPD comparability only when all stages of a life cycle have been considered. However, variations and deviations are possible". Example of variations: Different LCA software and background LCI datasets may lead to differences results for upstream or downstream of the life cycle stages declared. Environmental declarations from different programs based upon differing PCRs may not be comparable.

Comparison of the environmental performance of construction works and construction products using EPD information shall be based on the product's use and impacts at the construction works level. In general, EPDs may not be used for comparability purposes when not considered in a construction works context.

When comparing EPDs created using this PCR, variations and deviations are possible. Example of variations: Different LCA software and background LCI datasets may lead to differences in results for upstream or downstream of the life cycle stages declared.

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# ENVIRONMENTAL PRODUCT DECLARATION



DECORATIVE HIGH-PRESSURE LAMINATE (HPL), STANDARD GRADE  
DECORATIVE SURFACING MATERIAL FOR INTERIOR FURNITURE AND ARCHITECTURAL APPLICATIONS

According to ISO 14025,  
and ISO 21930:2017

## 1. Product Definition and Information

### 1.1. Description of Company/Organization

Skydecor Laminates Private Limited is an Indian manufacturer of decorative surfacing materials for interior and architectural applications. The company produces high-pressure laminates using resin-impregnated paper technology and operates an integrated manufacturing facility in Noida, Uttar Pradesh. Skydecor is committed to quality, innovation, and transparent environmental disclosure, supporting green building initiatives through verified life cycle assessment and Environmental Product Declarations.

### 1.2. Product Description

#### Product Identification

Decorative High-Pressure Laminate (HPL), Standard Grade, comprising decorative paper impregnated with melamine formaldehyde (MF) resin and kraft paper core layers impregnated with phenol formaldehyde (PF) resin, consolidated under high temperature and pressure. The product family includes all decorative designs and patterns produced using the same materials and manufacturing technology.

#### Product Specification

- Decorative paper impregnated with melamine formaldehyde (MF) resin
- Kraft paper core impregnated with phenol formaldehyde (PF) resin
- Manufactured under high pressure and temperature
- Thickness range: 0.62 mm – 6.00 mm
- Declared (representative) thickness: 0.77 mm approximately 1.08 kg

The declared product consists of the following main material components (percentage by mass of declared unit), this has been directly on normalized LCA inventory data,

Main Material Component	% by Mass
Kraft paper (cellulose core layers)	≈83%
Decorative paper (surface layer + backing tissue)	≈8%
Phenol Formaldehyde (PF) resin system (core binder)	≈6–7%
Melamine Formaldehyde (MF) resin system (surface binder)	≈3–4%
Minor additives & auxiliaries	<1%
<b>Total</b>	<b>100%</b>

- Supplied as finished laminate sheets at the factory gate



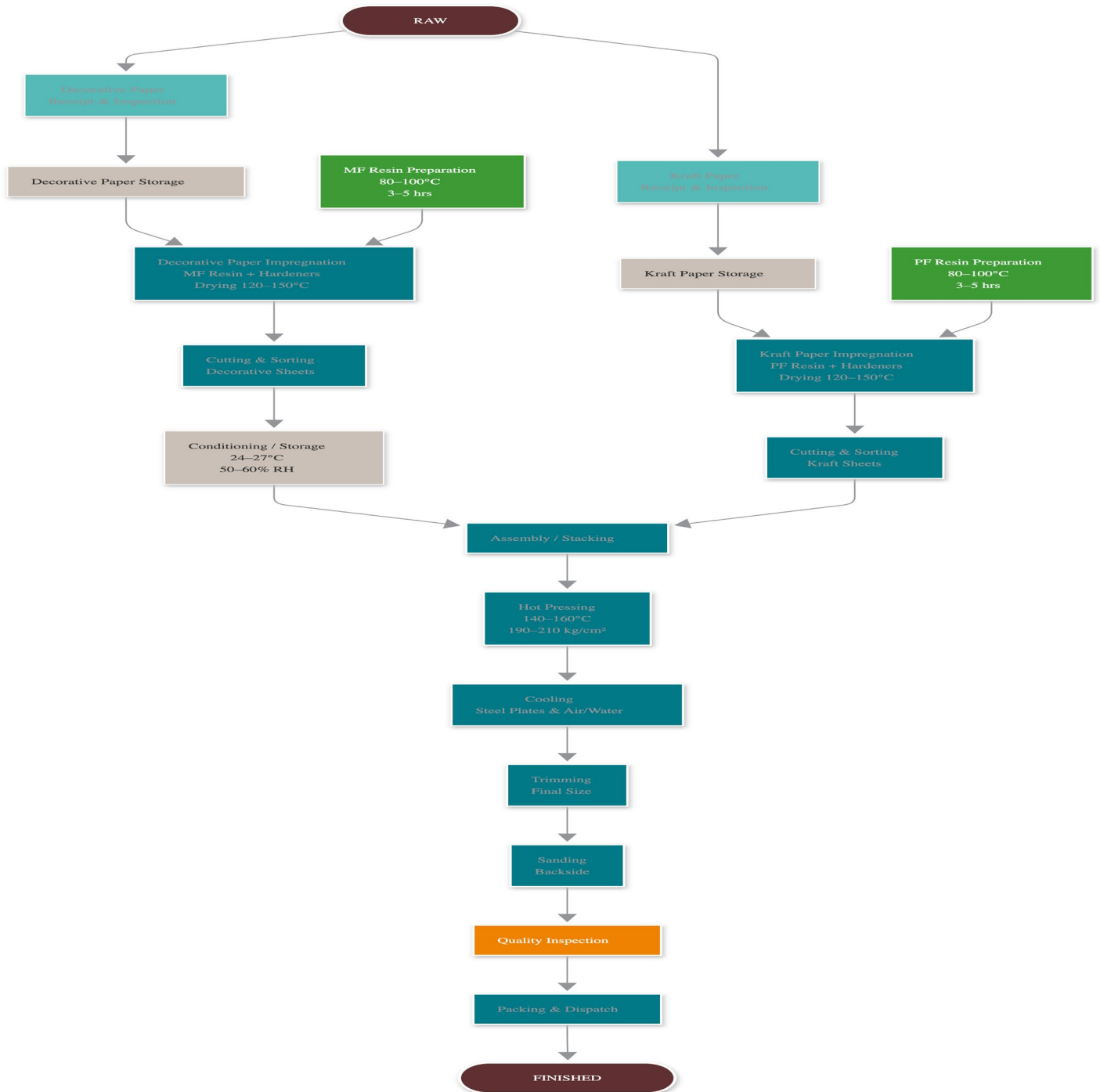
# ENVIRONMENTAL PRODUCT DECLARATION



DECORATIVE HIGH-PRESSURE LAMINATE (HPL), STANDARD GRADE  
 DECORATIVE SURFACING MATERIAL FOR INTERIOR FURNITURE AND ARCHITECTURE APPLICATIONS

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## Flow Diagram



# ENVIRONMENTAL PRODUCT DECLARATION



**DECORATIVE HIGH-PRESSURE LAMINATE (HPL), STANDARD GRADE**  
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## Product Average

The declared product represents the area-weighted average thickness (0.77 mm) of total Decorative HPL production during the reference period (April 2024 – March 2025). Production volumes across thickness categories were converted to surface area to derive a representative declared unit, in accordance with ISO 21930 and UL PCR requirements.

### 1.3. Application

Decorative HPL is used as a durable and decorative surfacing material for interior applications, including furniture, cabinetry, countertops, wall panels, partitions, and other architectural elements.

### 1.4. Declaration of Methodological Framework

Environmental Product Declaration is based on a cradle-to-gate Life Cycle Assessment conducted in accordance with ISO 14040:2006, ISO 14044:2006, ISO 14025:2006, ISO 21930:2017, UL Environment General Program Instructions (Part A, v4), and UL PCR Part B – Structural and Architectural Wood Products (current version).

### 1.5. Technical Requirements

Decorative High-Pressure Laminate (HPL), Standard Grade, is manufactured to meet applicable performance and quality requirements for decorative surfacing products. Technical characteristics such as thickness tolerance, surface finish, dimensional stability, and bonding performance are controlled through internal quality management procedures and routine inspections during production. The product family covered by this EPD includes thicknesses ranging from 0.62 mm to 6.00 mm, manufactured using identical materials and production technology.

### 1.6. Properties of Declared Product as Delivered

The declared product is supplied as finished laminate sheets at the factory gate. As delivered, the product exhibits a durable decorative surface, rigid structure, and uniform thickness. The laminate is suitable for further fabrication and bonding to substrates in interior applications.

### 1.7. Material Composition

The declared product consists of the following main material components (percentage by mass of declared unit, 1 m<sup>2</sup> at 0.77 mm thickness):

Main Material Component	% by Mass
Kraft paper (cellulose core layers)	83%
Decorative paper (surface layer + backing tissue)	8%
Phenol Formaldehyde (PF) resin system	6–7%
Melamine Formaldehyde (MF) resin system	3–4%
Minor additives and auxiliaries	<1%
<b>Total</b>	<b>100%</b>



# ENVIRONMENTAL PRODUCT DECLARATION



**DECORATIVE HIGH-PRESSURE LAMINATE (HPL), STANDARD GRADE**  
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## 1.8. Manufacturing

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Manufacturing activities included within Module A3 (Manufacturing) comprise on-site resin preparation, paper impregnation, drying, laminate assembly, hot pressing under controlled temperature and pressure, cooling, finishing, quality inspection, and packaging. Production is carried out at Skydecor Laminates Private Limited's facility in Noida, India.

## 1.9. Packaging

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Packaging materials (including protective interleaving sheets, wrapping films, strapping, and pallets) are included within Module A3 (Manufacturing) as they are applied prior to the factory gate. Packaging waste management after product delivery is outside the scope of this EPD.

## 1.10. Transportation

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Transportation within the declared scope includes inbound transport of raw materials and auxiliary inputs to the manufacturing facility (Module A2). Outbound transportation of finished products to customers is excluded, as this EPD is cradle-to-gate (Modules A1–A3).

## 1.11. Product Installation

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Product installation (Module A5) is outside the scope of this Environmental Product Declaration. Installation practices depend on the specific application and substrate and should follow manufacturer recommendations and applicable standards.

## 1.12. Use

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The use phase (Modules B1–B7), including maintenance, repair, replacement, and operational impacts, is outside the system boundary of this cradle-to-gate EPD.

## 1.13. Reference Service Life and Estimated Building Service Life

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A Reference Service Life (RSL) has not been declared, as this EPD is cradle-to-gate (Modules A1–A3) and does not include use stage modeling. Service life is dependent on application, installation quality, maintenance practices, and environmental exposure conditions. No building service life assumptions are included.

## 1.14. Reuse, Recycling, and Energy Recovery

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Reuse, recycling, and energy recovery scenarios (Modules C and D) are not included in this EPD. End-of-life treatment is dependent on regional waste management practices and has not been modeled. No benefits or loads beyond the system boundary (Module D) are declared.

## 1.15. Disposal

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End-of-life treatment and disposal (Modules C1–C4) are outside the system boundary of this cradle-to-gate EPD. Disposal pathways such as landfill or energy recovery may occur depending on regional regulations; however, these stages are not assessed in this declaration.



# ENVIRONMENTAL PRODUCT DECLARATION



DECORATIVE HIGH-PRESSURE LAMINATE (HPL), STANDARD GRADE  
DECORATIVE SURFACING MATERIAL FOR INTERIOR FURNITURE AND ARCHITECTURE  
APPLICATIONS

According to ISO 14025,  
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## 2. Life Cycle Assessment Background Information

### 2.1. Functional or Declared Unit

The declared unit is **1 m<sup>2</sup> of Decorative High-Pressure Laminate (HPL), Standard Grade, with a thickness of 0.77 mm**, representing the area-weighted average thickness of production during the reference period (April 2024 – March 2025). All inputs and outputs are normalized to this declared unit. The declared unit corresponds to approximately 1.08 kg of finished laminate.

### 2.2. System Boundary

The Life Cycle Assessment follows a **cradle-to-gate** system boundary, including:

- **A1:** Raw material supply
- **A2:** Transport of raw materials to the manufacturing facility
- **A3:** Manufacturing

Modules A4–A5 (construction process), B1–B7 (use stage), C1–C4 (end-of-life), and Module D (benefits and loads beyond the system boundary) are excluded from this cradle-to-gate EPD.

### 2.3. Estimates and Assumptions

Land-use change (LUC) emissions were not modeled separately in the foreground system, as no direct land transformation occurs within the manufacturing facility (Module A3). Upstream forestry-related processes were modeled using ecoinvent v3.11 datasets, which include land occupation and transformation flows consistent with the database methodology. Based on the system boundary and data sources applied, LUC emissions are not expected to materially influence cradle-to-gate results.

### 2.4. Cut-off Criteria

Cut-off criteria are consistent with ISO 14044 and the ecoinvent cut-off system model. No known flows contributing less than 1% of mass, energy, or environmental relevance were intentionally excluded, and The cumulative contribution of excluded flows is estimated to be below 5% of total environmental impacts for each impact category.

### 2.5. Data Sources

Primary, facility-specific data were collected from Skydecor Laminates Private Limited for manufacturing operations (Module A3). Secondary data for upstream processes and transport were sourced from **ecoinvent v3.11 (cut-off system model)** and other authoritative references, ensuring consistency with ISO 14044 and UL program requirements. **LCA software & version:** openLCA version 2.6.0 (GreenDelta GmbH)

### 2.6. Data Quality

Data quality was evaluated in accordance with ISO 14044 and UL Environment General Program Instructions. Primary data for manufacturing (Module A3) are facility-specific and representative of normal operations during the reference period. Secondary data for upstream processes and transport were sourced from ecoinvent v3.11 and other recognized references. The reference period for primary data collection was April 2024 through March 2025.



# ENVIRONMENTAL PRODUCT DECLARATION



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Data quality was assessed for temporal, geographical, and technological representativeness, completeness, consistency, and reliability, and was deemed suitable for EPD development.

## 2.7. Period under Review

The primary data collection period for this Life Cycle Assessment covers April 2024 to March 2025 and represents twelve consecutive months of production at the manufacturing facility (Module A3).

## 2.8. Allocation

Allocation was applied only where unavoidable and followed the hierarchy prescribed in ISO 14044.

Manufacturing inputs and outputs (Module A3) were allocated on an area basis (m<sup>2</sup>), as decorative laminate production is fundamentally surface-area driven. The declared thickness of 0.77 mm represents the area-weighted average production thickness during the reference period.

Upstream processes (Module A1) follow the allocation rules embedded within the ecoinvent v3.11 cut-off system model.

Transport impacts (Module A2) were calculated based on tonne-kilometres and allocated to the declared unit on an area basis.

No economic allocation was applied.

## 2.9. Comparability (Optional)

Environmental declarations from different programs based upon differing PCRs may not be comparable.

Comparison of the environmental performance of construction works and construction products using EPD information shall be based on the product's use and impacts at the construction works level. In general, EPDs may not be used for comparability purposes when not considered in a construction works context.

When comparing EPDs created using this PCR, variations and deviations are possible. Different LCA software and background LCI datasets may lead to differences in results for upstream or downstream life cycle stages declared.

## 3. Life Cycle Assessment Scenarios

**Table 1. Transport to the building site (A4)**

NAME	VALUE	UNIT
Fuel type	ND	
Liters of fuel	ND	l/100km
Vehicle type	ND	
Transport distance	ND	km
Capacity utilization (including empty runs, mass based)	ND	%
Gross density of products transported	ND	kg/m <sup>3</sup>
Weight of products transported (if gross density not reported)	ND	kg
Volume of products transported (if gross density not reported)	ND	m <sup>3</sup>



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Capacity utilization volume factor (factor: =1 or <1 or ≥ 1 for compressed or nested packaging products)	ND	-
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**Table 2. Installation into the building (A5)**

NAME	VALUE	UNIT
Ancillary materials	ND	kg
Net freshwater consumption specified by water source and fate (amount evaporated, amount disposed to sewer)	ND	m <sup>3</sup>
Other resources	ND	kg
Electricity consumption	ND	kWh
Other energy carriers	ND	MJ
Product loss per functional unit	ND	kg
Waste materials at the construction site before waste processing, generated by product installation	ND	kg
Output materials resulting from on-site waste processing (specified by route; e.g. for recycling, energy recovery and/or disposal)	ND	kg
Biogenic carbon contained in packaging	ND	kg CO <sub>2</sub>
Direct emissions to ambient air, soil and water	ND	kg
VOC content	ND	µg/m <sup>3</sup>

**Table 3. Reference Service Life**

NAME	VALUE	UNIT
RSL	ND	years
Declared product properties (at the gate) and finishes, etc.	ND	Units as appropriate
Design application parameters (if instructed by the manufacturer), including references to the appropriate practices and application codes	ND	Units as appropriate
An assumed quality of work, when installed in accordance with the manufacturer's instructions	ND	Units as appropriate
Outdoor environment, (if relevant for outdoor applications), e.g. weathering, pollutants, UV and wind exposure, building orientation, shading, temperature	ND	Units as appropriate
Indoor environment, (if relevant for indoor applications), e.g. temperature, moisture, chemical exposure	ND	Units as appropriate
Use conditions, e.g. frequency of use, mechanical exposure.	ND	Units as appropriate
Maintenance, e.g. required frequency, type and quality of replacement components	ND	Units as appropriate

**Table 4. Maintenance (B2)**

NAME	VALUE	UNIT
Maintenance process information (cite source in report)	ND	-
Maintenance cycle	ND	Number/ RSL
Maintenance cycle	ND	Number/ ESL
Net freshwater consumption specified by water source and fate (amount evaporated, amount disposed to sewer)	ND	m <sup>3</sup>
Ancillary materials specified by type (e.g. cleaning agent)	ND	kg



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According to ISO 14025,  
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Other resources	ND	kg
Energy input, specified by activity, type and amount	ND	kWh
Other energy carriers specified by type	ND	kWh
Power output of equipment	ND	kW
Waste materials from maintenance (specify materials)	ND	kg
Direct emissions to ambient air, soil and water	ND	kg
Further assumptions for scenario development (e.g. frequency and time period of use, number of occupants);	ND	

**Table 5. Repair (B3)**

NAME	VALUE	UNIT
Repair process information (cite source in report)	ND	-
Inspection process information (cite source in report)	ND	-
Repair cycle	ND	Number/ RSL
Repair cycle	ND	Number/ ESL
Net freshwater consumption specified by water source and fate (amount evaporated, amount disposed to sewer)	ND	m <sup>3</sup>
Ancillary materials specified by type (e.g. cleaning agent)	ND	kg
Energy input, specified by activity, type and amount	ND	kWh
Waste materials from repair (specify materials)	ND	kg
Direct emissions to ambient air, soil and water	ND	kg
Further assumptions for scenario development (e.g. frequency and time period of use, number of occupants);	ND	

**Table 6. Replacement (B4)**

NAME	VALUE	UNIT
Replacement cycle	ND	Number/ RSL
Replacement cycle	ND	Number/ ESL
Energy input, specified by activity, type and amount	ND	kWh
Net freshwater consumption specified by water source and fate (amount evaporated, amount disposed to sewer)	ND	m <sup>3</sup>
Ancillary materials specified by type (e.g. cleaning agent)	ND	kg
Replacement of worn parts, specify parts/materials	ND	kg
Direct emissions to ambient air, soil and water	ND	kg
Further assumptions for scenario development, e.g. frequency and time period of use	ND	As appropriate



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**Table 7. Refurbishment (B5)**

NAME	VALUE	UNIT
Refurbishment process description (cite source in report)	ND	
Replacement cycle	ND	Number/ RSL
Replacement cycle	ND	Number/ ESL
Energy input, specified by activity, type and amount	ND	kWh
Net freshwater consumption specified by water source and fate (amount evaporated, amount disposed to sewer)	ND	m <sup>3</sup>
Material input for refurbishment, including ancillary materials specified by type (e.g. cleaning agent)	ND	kg
Waste material(s), specified by material	ND	kg
Direct emissions to ambient air, soil and water	ND	kg
Further assumptions for scenario development (e.g. frequency and time period of use, number of occupants);	ND	

**Table 8. Operational energy use (B6) and Operational water use (B7)**

NAME	VALUE	UNIT
Net freshwater consumption specified by water source and fate (amount evaporated, amount disposed to sewer)	ND	m <sup>3</sup>
Ancillary materials	ND	kg
Energy input, specified by activity, type and amount	ND	kWh
Equipment power output	ND	kW
Characteristic performance (e.g. energy efficiency, variation of performance with capacity utilization)	ND	Units as appropriate
Direct emissions to ambient air, soil and water	ND	kg
Further assumptions for scenario development (e.g. frequency and time period of use, number of occupants);	ND	As appropriate

**Table 9. End of life (C1-C4)**

NAME	VALUE	UNIT
Assumptions for scenario development (description of deconstruction, collection, recovery, disposal method and transportation)	ND	
Collection process (specified by type)	Collected separately	kg
	Collected with mixed construction waste	kg
Recovery (specified by type)	Reuse	kg
	Recycling	kg
	Landfill	kg
	Incineration	kg



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	Incineration with energy recovery	ND	kg
	Energy conversion efficiency rate	ND	
Disposal (specified by type)	Product or material for final deposition	ND	kg
Removals of biogenic carbon (excluding packaging)		ND	kg CO <sub>2</sub>

**Table 10. Reuse, recovery and/or recycling potentials (D), relevant scenario information**

NAME	VALUE	UNIT
Net energy benefit from energy recovery from waste treatment declared as exported energy in C3 (R>0.6)	ND	MJ
Net energy benefit from thermal energy due to treatment of waste declared as exported energy in C4 (R<0.6)	ND	MJ
Net energy benefit from material flow declared in C3 for energy recovery	ND	MJ
Process and conversion efficiencies	ND	
Further assumptions for scenario development (e.g. further processing technologies, assumptions on correction factors);	ND	

## 4. Life Cycle Assessment Results

This Environmental Product Declaration follows a cradle-to-gate system boundary including Modules A1–A3. Modules A4–D are outside the scope of this declaration and are reported as ND (Not Declared).

**Table 11. Description of the system boundary modules**

	PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY
	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
	Raw material supply	Transport	Manufacturing	Transport from gate to site	Assembly/Install	Use	Maintenance	Repair	Replacement	Refurbishment	Building Operational Energy Use During Product Use	Building Operational Water Use During Product Use	Deconstruction	Transport	Waste processing	Disposal	Reuse, Recovery, Recycling Potential
<b>EPD Type</b>	Y	Y	Y	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND



# ENVIRONMENTAL PRODUCT DECLARATION



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According to ISO 14025,  
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## 4.1. Life Cycle Impact Assessment Results

The following impact assessment results are calculated for Modules A1–A3 using IPCC AR5 and TRACI v2.2 characterization methods. LCIA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins, or risks.

**Table 12. North American Impact Assessment Results**

TRACI v2.2	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
<b>GWP 100 [kg CO<sub>2</sub> eq]</b>	4.06E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
<b>ODP [kg CFC-11 eq]</b>	1.51E-07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
<b>AP [kg SO<sub>2</sub> eq]</b>	1.97E-02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
<b>EP [kg N eq]</b>	5.86E-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
<b>POCP [kg O<sub>3</sub> eq]</b>	3.05E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
<b>ADPelement [kg Sb-eq]</b>	Not assessed*	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
<b>ADP<sub>fossil</sub> [MJ, LHV]</b>	7.08E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Biogenic CO<sub>2</sub> emissions (reported separately): 2.97E+00 kg CO<sub>2</sub> (Module A3).

These six impact categories are globally deemed mature enough to be included in Type III environmental declarations. Other categories are being developed and defined and LCA should continue making advances in their development. However, the EPD users shall not use additional measures for comparative purposes.

Biogenic CO<sub>2</sub> emissions are reported separately and are not included in the fossil climate change indicator.

**Table 13. EU Impact Assessment Results**

European impact assessment indicators were not calculated, as this EPD follows the UL North American PCR requirements.

CML v4.2	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
GWP 100 [kg CO <sub>2</sub> eq]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ODP [kg CFC-11 eq]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
AP [kg SO <sub>2</sub> eq]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
EP [kg PO <sub>4</sub> <sup>-3</sup> eq]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
POCP [kg ethene eq]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ADP <sub>element</sub> [kg Sb-eq]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ADP <sub>fossil</sub> [MJ, LHV]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

## 4.2. Life Cycle Inventory Results

Resource use, output flow, and carbon balance indicators according to EN 15804 were not calculated for this cradle-to-gate North American EPD. Therefore, indicators not modeled in the LCA are reported as ND.



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**Table 14. Resource Use**

PARAMETER	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
RPR <sub>E</sub> [MJ, LHV]	2.44E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
RPR <sub>M</sub> [MJ, LHV]	0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
RPR <sub>T</sub> [MJ, LHV]	2.44E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
NRPR <sub>E</sub> [MJ, LHV]	2.02E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
NRPR <sub>M</sub> [MJ, LHV]	4.69E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
NRPR <sub>T</sub> [MJ, LHV]	6.71E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
SM [kg]	0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
RSF [MJ, LHV]	0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
NRSF [MJ, LHV]	0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
RE [MJ, LHV]	0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
FW [m <sup>3</sup> ]	3.05E-04	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

**Table 15. Output Flows and Waste Categories**

PARAMETER	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
HWD [kg]	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
NHWD [kg]	1.17E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
HLRW [kg] or [m <sup>3</sup> ]	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
ILLRW [kg] or [m <sup>3</sup> ]	1.01E-06	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
CRU [kg]	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
R [kg]	2.53E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
MER [kg]	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
EE [MJ, LHV]	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND



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Table 16. Carbon Emissions and Removals

PARAMETER	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
BCRP [kg CO <sub>2</sub> ]	2.97E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
BCEP [kg CO <sub>2</sub> ]	2.97E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
BCRK [kg CO <sub>2</sub> ]	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
BCEK [kg CO <sub>2</sub> ]	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
BCEW [kg CO <sub>2</sub> ]	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
CCE [kg CO <sub>2</sub> ]	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
CCR [kg CO <sub>2</sub> ]	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
CWNR [kg CO <sub>2</sub> ]	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

## 5. LCA Interpretation

The Life Cycle Assessment (LCA) results indicate that the cradle-to-gate environmental impacts (Modules A1–A3) of Decorative High-Pressure Laminate (HPL), Standard Grade (0.77 mm), are predominantly driven by raw material production (Module A1). Across all reported midpoint impact categories (IPCC AR5 for climate change and TRACI v2.2 indicators), Module A1 contributes the majority share of total impacts, reflecting the material- and energy-intensive nature of upstream resin and paper manufacturing processes.

### Climate Change (Fossil GWP)

Total cradle-to-gate fossil climate change impact is:

**4.06 kg CO<sub>2</sub>-eq per m<sup>2</sup>**

Module contribution breakdown:

- **Module A1 (Raw materials):** 3.28E+00 kg CO<sub>2</sub>-eq (~81%)
- **Module A2 (Transport):** 4.34E-01 kg CO<sub>2</sub>-eq (~11%)
- **Module A3 (Manufacturing):** 3.50E-01 kg CO<sub>2</sub>-eq (~9%)

Upstream resin production (phenol-formaldehyde and melamine-formaldehyde systems) is the primary driver of fossil GWP due to fossil-based feedstocks and energy requirements for chemical synthesis. Kraft paper and decorative paper production further contribute to acidification, eutrophication, and ozone formation impacts through pulp and paper processing and associated energy consumption.

### Manufacturing Contributions (Module A3)

Manufacturing operations at the Skydecor facility represent a secondary contribution to total impacts. Impacts within Module A3 are primarily associated with:



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- Electricity consumption for resin preparation, impregnation, hot pressing, sanding, and auxiliary systems
- Combustion emissions associated with biomass-based thermal energy

Thermal energy demand is largely supplied by biomass (wood chips), reducing reliance on fossil fuels. However, combustion-related emissions contribute to **acidification, smog formation, and particulate matter indicators**.

## Transport Contributions (Module A2)

Inbound transport of raw materials contributes a comparatively small share of total cradle-to-gate impacts (approximately 11% of fossil GWP). Impacts arise primarily from diesel combustion in heavy-duty freight transport.

## Biogenic Carbon Reporting

Biogenic CO<sub>2</sub> emissions of **2.97 kg CO<sub>2</sub> per m<sup>2</sup>** arise from biomass combustion in Module A3 and are reported separately in accordance with ISO 21930 and UL GPI requirements. These emissions are excluded from the fossil climate change indicator. Biogenic carbon removal and emission are balanced within the product system, and no long-term carbon storage is claimed.

## Variance of LCIA Results Across Product Thicknesses

The environmental results presented in this report and EPD are calculated for a declared unit of **1 m<sup>2</sup> Decorative HPL at 0.77 mm thickness**, representing the area-weighted average production thickness during the reference period.

Because environmental impacts are primarily driven by material mass and resin content, impacts scale approximately linearly with product thickness for products within the same formulation and manufacturing configuration.

Impacts for alternative thicknesses within the declared product family may therefore be estimated using proportional scaling:

$$\text{Scaling Factor} = \frac{\text{Target Thickness (mm)}}{0.77}$$
$$\text{Impact at X mm} = \text{Impact at 0.77 mm} \times \frac{X}{0.77}$$

This linear scaling approach is valid under the following conditions:

- Identical material composition and resin-to-paper ratio
- Same manufacturing process and energy profile
- No structural redesign or additional functional layers

## Representativeness and Improvement Potential

The results are representative of manufacturing during the reference period (April 2024–March 2025). As with all LCA studies, results depend on background dataset assumptions, modelling choices, and characterization methods.

Primary opportunities for environmental performance improvement include:

- Optimization of resin formulation and reduction of fossil feedstock intensity
- Increased use of lower-carbon or renewable electricity
- Continued efficiency improvements in manufacturing operations



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## 6. Additional Environmental Information

### 6.1. Environment and Health During Manufacturing

Manufacturing of Decorative High-Pressure Laminate (HPL) is conducted under controlled industrial conditions at the Skydecor Laminates Private Limited facility. Environmental and occupational health considerations during manufacturing primarily relate to energy use, air emissions, wastewater generation, and solid waste management.

Potential air emissions include volatile organic compounds (VOCs) and formaldehyde, arising mainly from resin synthesis, impregnation, and hot-pressing operations. These emissions are managed through engineered control measures, including process optimization, exhaust ventilation, and treatment systems, in accordance with applicable environmental regulations and industry best practices.

Biomass-based thermal energy systems are used for steam generation. Biogenic CO<sub>2</sub> emissions arising from biomass combustion are reported separately from fossil climate change impacts in accordance with ISO 21930 and UL GPI requirements. No long-term biogenic carbon storage is claimed for the declared unit.

Water is consumed mainly for process operations and cooling, with wastewater treated prior to discharge in accordance with applicable environmental requirements. Solid wastes, including paper trims, sanding dust, and biomass ash, are managed through appropriate recycling, recovery, or disposal routes. Overall, manufacturing activities are designed to minimize risks to worker health and the surrounding environment through established environmental management and occupational safety practices.

Hazardous substances are used within controlled industrial processes during manufacturing (e.g., resin precursors such as phenol and formaldehyde). These substances are managed in accordance with applicable regulatory requirements and occupational health and safety protocols. No hazardous substances are intentionally released under normal operating conditions beyond permitted regulatory limits.

### 6.2. Environment and Health During Installation

The installation of Decorative High-Pressure Laminate (HPL) panels does not involve energy-intensive processes and has negligible direct environmental impact within the defined system boundary. Installation activities are primarily mechanical in nature, such as cutting, trimming, and fixing of panels, and do not require specialized equipment with significant emissions.

Potential health considerations during installation may include dust generation from cutting or machining and the use of adhesives, depending on the application method. These risks can be effectively managed through standard good practice measures, such as adequate ventilation, use of personal protective equipment (PPE), and adherence to manufacturer installation guidelines.

No significant emissions to air or water are expected during installation, and any installation-related waste is typically limited to small quantities of off-cuts, which can be collected and managed according to local waste handling practices.

Installation impacts are outside the declared system boundary of this cradle-to-gate EPD.

### 6.3. Extraordinary Effects

#### Fire

Decorative High-Pressure Laminate (HPL) is an organic composite material composed of resin-impregnated papers and may contribute to fire load under extreme fire conditions. Fire performance characteristics such as reaction to fire, flame spread, and smoke development depend on product configuration, thickness, substrate, and installation method.



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These characteristics are assessed separately under applicable fire testing standards and are **not evaluated within the scope of this Life Cycle Assessment**. No extraordinary environmental releases beyond those typically associated with combustion of wood-based products are expected under fire conditions.

## Water

Exposure to water, such as flooding or prolonged contact with moisture, does not result in significant environmental emissions under normal conditions. Decorative HPL panels are dimensionally stable and resistant to short-term moisture exposure when properly installed. Any environmental effects associated with water exposure are limited to potential physical damage to the product and do not involve hazardous substance release. Such effects are **outside the scope of the LCA**, which addresses cradle-to-gate production stages only.

## Mechanical Destruction

Mechanical destruction (e.g., cutting, crushing, or demolition) of Decorative HPL may generate dust and solid fragments typical of wood-based materials. These effects are localized and can be managed through standard dust control and waste handling practices. No extraordinary environmental impacts or emissions are expected beyond those commonly associated with mechanical processing of composite wood products. End-of-life scenarios are not included within the declared system boundary of this EPD.

## 6.4. Delayed Emissions

No significant delayed emissions to air, water, or soil are expected during the use phase of Decorative High-Pressure Laminate (HPL) under normal conditions of application. Potential emissions related to residual formaldehyde or other substances are governed by product formulation and compliance with applicable product standards and regulations. Delayed emissions occurring outside the cradle-to-gate system boundary (Modules A1–A3) are **not assessed in this Life Cycle Assessment**.

Any potential emissions during the use phase are governed by applicable product performance standards and regulatory limits and are not modeled within this cradle-to-gate assessment.

In accordance with ISO 21930 Section 8.4.2 and applicable market requirements, no regulated dangerous substances are intentionally released during normal product use. The product does not emit gamma or ionizing radiation. Indoor air emissions, including formaldehyde, are governed by applicable product performance standards and regulatory limits for the markets of applicability. No regulated substances are expected to leach to water or soil under normal conditions of use.

## 6.5. Environmental Activities and Certifications

Skydecor Laminates Private Limited maintains documented environmental management procedures and compliance systems in accordance with applicable regulatory requirements, through the implementation of structured environmental management practices and continuous performance improvement initiatives. The manufacturing facility operates in alignment with applicable environmental regulations and industry best practices related to energy use, emissions control, water management, and waste handling.

This Environmental Product Declaration (EPD) has been developed in accordance with **ISO 14025**, **ISO 21930**, and applicable **UL Environment General Program Instructions and Product Category Rules**, and is intended for third-party verification and registration under the UL EPD Program.

## 6.6. Further Information



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Additional technical information regarding Decorative High-Pressure Laminate (HPL), including product specifications, installation guidance, safety data, and regulatory compliance, can be obtained directly from the manufacturer. Further details related to this Environmental Product Declaration and the underlying Life Cycle Assessment methodology may be provided upon request, subject to data confidentiality considerations.

## 7. Supporting Documentation

The Life Cycle Assessment (LCA) and Environmental Product Declaration (EPD) are supported by the following documentation:

- Primary manufacturing data collected for the reference period (April 2024 – March 2025)
- Background life cycle inventory datasets sourced from ecoinvent v3.11 (cut-off system model)
- LCA modeling files developed using openLCA version 2.6
- Impact assessment methods including IPCC AR5 (GWP100), TRACI v2.2, and CML v4.7 (for fossil resource depletion)
- Allocation procedures and methodological assumptions documented in accordance with ISO 14044
- Internal data quality checks and consistency reviews
- Applicable ISO standards (ISO 14025, ISO 21930, ISO 14044), UL General Program Instructions, and UL Product Category Rules

All supporting documentation has been prepared to ensure transparency, traceability, and suitability for independent third-party verification under the UL Environment EPD Program.

## 8. References

1. ISO 14040:2006  
Environmental management — Life cycle assessment — Principles and framework  
International Organization for Standardization (ISO).
2. ISO 14044:2006  
Environmental management — Life cycle assessment — Requirements and guidelines  
International Organization for Standardization (ISO).
3. ISO 14025:2006  
Environmental labels and declarations — Type III environmental declarations — Principles and procedures  
International Organization for Standardization (ISO).
4. ISO 21930:2017  
Sustainability in buildings and civil engineering works — Core rules for environmental product declarations of construction products and services  
International Organization for Standardization (ISO).
5. UL Environment  
General Program Instructions for Environmental Product Declarations (GPI), Part A, Version 4  
UL Environment.
6. UL Product Category Rule (PCR) Part B  
Structural and Architectural Wood Products  
UL Environment.
7. TRACI 2.2  
Tool for the Reduction and Assessment of Chemical and Other Environmental Impacts  
U.S. Environmental Protection Agency (US EPA).



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- 8.ecoinvent Database v3.11  
Life Cycle Inventory Database — Cut-off system model  
ecoinvent Association, Zurich, Switzerland.
9. openLCA Software (Professional Version)  
GreenDelta GmbH, Berlin, Germany.
10. Central Electricity Authority (CEA), Government of India  
CO<sub>2</sub> Baseline Database for the Indian Power Sector  
Electricity grid emission factor used for electricity modelling.
11. IPCC (2006)  
IPCC Guidelines for National Greenhouse Gas Inventories  
Intergovernmental Panel on Climate Change.  
(Used for biomass combustion emission factors)
12. EU BAT / BREF Documents
  - Production of Polymers & Resins
  - Wood-Based Panels Industry  
European Commission, Joint Research Centre.  
(Used for benchmark emission and wastewater assumptions)
13. Published Industry EPDs and Peer-Reviewed Literature  
Publicly available Environmental Product Declarations and technical literature for decorative laminates and wood-based panel products, used for contextual benchmarking and conservative modelling assumptions.

