GLOBAL GREEN TAG INTERNATIONAL PTY LTD
Level 38/71 Eagle St, Brisbane, OLD, 4000, Australia

EPD™

Environmental Product Declaration

in accordance with ISO 14025 and EN 15804

Green-Flor®

G. T. Floor CO., LTD

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Product

LLT PVC Flooring

ECO PLATFORM
ECO PLATFORM EPD VERIFIED

Environmental Product Declaration Details

EPD Type	Cradle to Gate with modules C1–C4 and module D (A1–A3, C and D)
EPD Number	JDC:FL01:2024:EP
Issue Date	02 August 2024
Valid Until	02 August 2029
GPI Version	Version 2.1
Demonstration of Verification	
PCR	CEN Standard EN 15804+A2 2019 serves as core Product Category Rules (PCR). Sub-PCR FC:2022 V1 Interior Floor Coverings V1
Verification	Independent external verification of the declaration and data, mandatory for business-to-consumer communication according to ISO 14025:2010.
Communication	This EPD discloses potential environmental outcomes compliant with EN 15804 for business-to-business communication.
Comparability	EPD of construction products may not be comparable if they do not comply with EN 15804. Different program EPDs may not be comparable. Comparability is further dependent on the product category rules and data source used.
Reliability	LCIA results are relative expressions that do not predict impacts on category endpoints, exceeding of thresholds, safety margins or risks.
Owner	This EPD is the property of the declared manufacturer.
Explanations	Further explanatory information is available at info@globalgreentag.com or by contacting epd@globalgreentag.com.

EPD Program Operator

Global GreenTag International Pty ,Ltd

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Program Description

EPD Scope	Cradle to gate with options (A1 to A3, C1-C4 and D)
EPD Type	EPD based on specific site and product data
System boundary	The system boundary with nature includes processing material and energy system inputs, transport to factory gate, manufacturing plus packing, waste disposal, as well as waste removal and waste disposal after the expiration of product life.
Stages included	A1-A3, C1-C4, D
Stages excluded	A4-A5, B1-B7
Information Modules	Figure 1 depicts all modules being declared including some with zero results. Any module not declared (MND) does not indicate a zero result.

Model	Actual			*Scenarios*												*Potential*
Information	*Life Cycle Assessment*															*Supplementary*
Stages	*Product*			*Construct*		*Use*							*End-of-Life*				*Benefit & load beyond system*
Modules						*Fabric*					*Operation*						
Unit Operations	*A1*	*A2*	*A3*	A4	A5	*B1*	*B2*	*B3*	*B4*	*B5*	*B6*	*B7*	*C1*	*C2*	*C3*	*C4*	*D*
Cradle to grave phases	*Resources*	*Transport*	*Manufacture*	*Transport*	*Construct*	*Use*	*Maintain*	*Repair*	*Replace*	*Refurbish*	*Energy Use*	*Water use*	*Demolish*	*Transport*	*Process Waste*	*Disposal*	*Reuse*
Modules Declared	✓	✓	✓	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	✓	✓	✓	✓	✓

Note: ND = Module not declared ✓= included

Figure 1 EPD Life Cycle Modules Cradle to Grave

Product Information	General Information
Brand Name & Code	Green-Flor PVC flooring
Range Names	LLT flooring
Factory warranty	10-20 Years
Geographical Area	China
Application	Indoor flooring
Function in Building	Flooring covering
Reference Service Life	10 Years
Declared Unit	9.4 kg of LLT interior floor covering per square metre covered in any building sectors cradle to gate.
Manufacturer Warranty	10-20 Years
Substances Of Very High Concern	None

	Standard/Certification	*Status*	*Last Date Completed*
Test Reports	EN 13501-1:2018 Fire	B_{fl}-s1, passed	Apr 12, 2023
	ISO 8301:1991 Thermal Conductivity and Thermal Resistance	<0.05 m^2K/W, passed	Apr 11, 2023
	EN 717-1:2004 Formaldehyde Emission (In air)	0.080 mg/m^3	Apr 14, 2023
	BS EN 14041:2018 Annex B & EN12673:1999 Pentachlorophenol (PCP)	0.1 mg/kg	Apr 11, 2023
	ASTM E 648-19ae1 Critical Radiant Flux	Min. 1.1W/cm^2 (Class I > 0.45W/cm2), passed	Apr 11, 2023
	ASTM E662-21ae1 Smoke Density	Smoke density of <450	Apr 11, 2023
	EN ISO 26987:2012 Determination of Staining and Resistance to Chemical	Index 0 (Not affected, passed)	May 31, 2024
	EN ISO 105-B02:2014 Colour Fastness to Light	≥6, passed	Jun 05, 2024
	ISO 4918:2016+Amd.1:2018 Castor Chair Test	No visible damage after 25000 cycles	May 31, 2024
	EN 1815:2016 Method A Static electricity propensity	<=2.0KV, passed	May 31, 2024
	BS 7976-2:2002+A1:2013 Slip Test	KT 2.0 #19 emboss Dry 60, Wet 32	May 31, 2024
	DIN EN 16165:2023-02 Annex B Slip Test	KT 2.0 #19 emboss R9 (9.7 drgree)	May 31, 2024
	EN 14372:2004 Diisononyl Phthalate (DINP)	0.010%	Jun 11, 2024

	EN 71-3:2019+A1:2021 Migration of certain elements	Passed	Jun 11, 2024
	SGS In-House method SVHC Test	SVHC ≤ 0.1%(w/w), passed	Jun 11, 2024
	ISO 16000-9:2006 / Cor1:2007	TVOC, SVOC not detectable	Jul 05, 2024
	EN 660-2:1999+A1:2003 Wear Resistance	Passed, Group T	May 31, 2024

Table 3 LLT resilient flooring specifications

Attribute	*Comment*	*Date*
Density	*1900 kg/m^3*	2024.02
Product thickness	*5mm*	
Product weight	*9.4 kg/m^2*	

Note: Specifications are current at time of publishing. Please check currency of specifications with manufacturer.

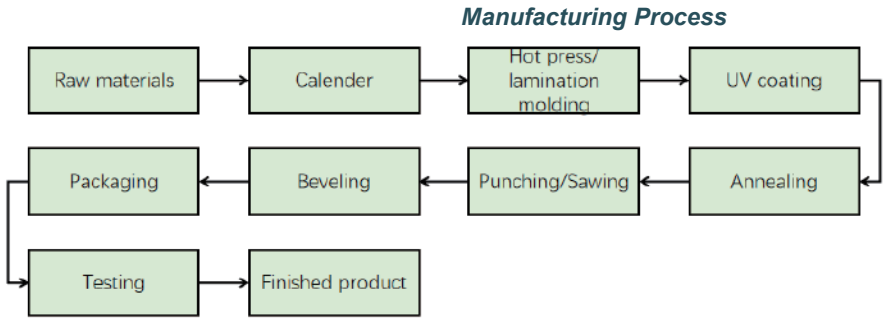

Figure 2. LLT resilient flooring Cradle to Gate System Boundary

Product Components

In product content listed below the % mass has a ±5% range and a confidence interval that is 90% certain to contain true population means at any time. Listing such 90±5% certainty considers normal resource acquisition, supply chain, sedimentation, seasonal, manufacturing and product colour variation over this EPD's 5-year validity period. This also allows for intellectual property protection whilst ensuring fullest possible transparency.

Table 4 List of key components and additives by function, type, key operation, source and amount

Function	Component	Source	Amount
Fillers	$CaCO_3$	China	50-75%
Binder	PVC	Taiwan, China	35-45%
Plasticizer	DOTP	China	10-15%
Backing	PRINTING FILMS	China	0-5%
Backing	Glass fiber (only for LLT flooring)	China	0-5%
Stabilizer	Calcium stearate	China	0-5%
Pigment	Carbon black	China	0-5%
Pigment	UV Lacquer.	China	0-5%
Packing			
Pallet	Wood pallet	China	55-60%
Cardboard caps	Cardboard box	China	35-40%
PET	PET Wrapping Film and Strapping	China	0-5%

materials is assumed at end-of-life.

Table 7 C1-C4 and D Scenario Information

Processes	Unit	LLT Scenario Value
Collection process by type	kg collected separately	9.4
	kg collected with mixed construction waste	0
Recovery system by type	Kg for re-use	0
	Kg for recycling	0
	Kg for energy recovery	0
Safe disposal	Kg or product or material for final disposal	9.4
transportation	km	161

Additional Technical Information

The environmental impact category indicators are also reported based on the CML-IA characterization factors according to EN15804.
No substances required to be reported as hazardous (as determined under the Resource Conservation and Recovery Act (RCRA (EPA, n.d.)) are associated with the production of flooring.

Additional Environmental Information

The flooring products in this EPD comply with the Indoor Air Comfort GOLD requirements. Low VOC cleaning materials are available for use in maintaining flooring.

Product Results

Table 8 LCA impact indicators, resource use, waste and other measured flows

Acronyms, methods and units of impact potentials plus inventory inputs and outputs, are defined below:

Impact Potentials	Acronym	Description of Methods	Units
Climate Change biogenic	GWP_{bio}	GWP biogenic [7]	kg CO_{2eq}
Climate Change luluc	GWP_{luluc}	GWP land use & change [7]	kg CO_{2eq}
Climate Change fossil	GWP_{ff}	GWP fossil fuels [7]	kg CO_{2eq}
Climate Change total	GWP_{t}	Global Warming Potential [7]	kg CO_{2eq}

Stratospheric Ozone Depletion	ODP	Stratospheric Ozone Loss [8]	kg CFC_{11eq}
Photochemical Ozone Creation	POCP	Summer Smog [9]	kg $NMOC_{eq}$
Acidification Potential	AP	Accumulated Exceedance [10]	mol H^{+}_{eq}
Eutrophication Freshwater	EP_{fresh}	Excess nutrients freshwater [11]	kg $Po_{4\ eq}$
Eutrophication Marine	EP_{marine}	Excess marine nutrients [11]	kg N_{eq}
Eutrophication Terrestrial	EP_{land}	Excess Terrestrial nutrients [11]	mol N_{eq}
Mineral & Metal Depletion[1]	ADP_{min}	Abiotic Depletion minerals [12]	kg Sb_{eq}
Fossil Fuel Depletion[1]	ADP_{ff}	Abiotic Depletion fossil fuel [13]	MJ_{ncv}
Water Depletion[1]	WDP	Water Deprivation Scarcity [14,15]	$m^3_{WDP\ eq}$
Particulate Matter Emissions	PM	SETAC-UNE [26]	Disease incidence
Ionizing Radiation, Human Health[2]	IRP	Human health effect model [27]	kBq U235 eq
Eco-toxicity (freshwater)[1]	ETP-fw	USEtox [28]	CTUe
Human toxicity, cancer effects[1]	HTP-c	USEtox [28]	CTUh
Human toxicity, non-cancer effects[1]	HTP-nc	USEtox [28]	CTUh
Land use related impacts/ Soil quality[1]	SQP	Soil quality index	dimensionless

Resource Use	**Acronym**	**Units**
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	PERE	MJ_{NCV}
Use of renewable primary energy resources used as raw materials	PERM	MJ_{NCV}
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	PERT	MJ_{NCV}
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	PENRE	MJ_{NCV}
Use of non-renewable primary energy resources used as raw materials	PENRM	MJ_{NCV}

[1] The results of this environmental impact indicator shall be used with care as uncertainties on these results are high or as there is limited experience with the indicator.
[2] This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	PENRT	MJ_{NCV}
Use of secondary material	SM	kg
Use of renewable secondary fuels	RSF	MJ_{NCV}
Use of non-renewable secondary fuels	NRSF	MJ_{NCV}
Use of net fresh water	FW	m3
Waste Type	**Acronym**	**Units**
Hazardous waste disposed	HWD	kg
Non-hazardous waste disposed	NHWD	kg
Radioactive waste disposed	RWD	kg
Other Outputs	**Acronym**	**Units**
Components for re-use	CRU	kg
Materials for recycling	MFR	kg
Materials for energy recovery	MER	kg
Exported energy	EE	Mj_{pec}

Note: MJ_{NCV} is MJ, net calorific value, Mj_{pec} is Mj, per energy carrier

Cradle to Gate + modules C1–C4 and module D Inventory

Table 2 Inventory Resource Use Results/1 m2-LLT flooring

		Product stage	End of life stage				Resource recovery stage
		A1-A3	C1	C2	C3	C4	D
Module Codes	Unit	Production	De-construction demolition	Transport	Waste processing	Disposal	Reuse, Recovery, Recycling
GWP-total	kg CO2 eq	2.69E+01	0.00E+00	1.44E-01	0.00E+00	9.53E-01	0.00E+00
GWP-luluc	kg CO2 eq	1.83E-02	0.00E+00	7.51E-05	0.00E+00	9.29E-05	0.00E+00
GWP-biogenic	kg CO2 eq	5.05E-02	0.00E+00	3.92E-05	0.00E+00	7.54E-05	0.00E+00
GWP-fossil	kg CO2 eq	2.68E+01	0.00E+00	1.44E-01	0.00E+00	9.53E-01	0.00E+00
ADP-fossil	MJ, net calorific value	4.63E+02	0.00E+00	2.07E+00	0.00E+00	2.48E+00	0.00E+00
ADP-minerals & metals	kg Sb eq.	2.22E-04	0.00E+00	4.48E-07	0.00E+00	2.55E-07	0.00E+00
EP-freshwater	kg P eq.	4.64E-03	0.00E+00	1.20E-05	0.00E+00	1.67E-05	0.00E+00
POCP	kg NMVOC eq.	8.42E-02	0.00E+00	9.46E-04	0.00E+00	1.33E-03	0.00E+00
AP	mol H+eq.	1.16E-01	0.00E+00	6.86E-04	0.00E+00	8.52E-04	0.00E+00
EP-terrestrial	mol N eq	2.36E-01	0.00E+00	2.78E-03	0.00E+00	3.27E-03	0.00E+00
EP-marine	kg N eq.	2.22E-02	0.00E+00	2.59E-04	0.00E+00	2.01E-02	0.00E+00
ODP	kg CFC 11 eq.	1.14E-05	0.00E+00	2.23E-09	0.00E+00	2.64E-09	0.00E+00
WDP	m3 world eq	7.54E+00	0.00E+00	1.01E-02	0.00E+00	1.48E-02	0.00E+00

See table 8 for additional information

Table 5 Optional Indicators -LLT flooring

		Product stage	End of life stage				Resource recovery stage
		A1-A3	C1	C2	C3	C4	D
Module Codes	Unit	Production	De-construction demolition	Transport	Waste processing	Disposal	Reuse, Recovery, Recycling
ETP-fw	CTUe	1.21E+02	0.00E+00	1.13E+00	0.00E+00	4.71E+00	0.00E+00
HTP-c	CTUh	2.32E-08	0.00E+00	7.58E-11	0.00E+00	7.12E-11	0.00E+00
HTP-nc	CTUh	1.77E-06	0.00E+00	1.61E-09	0.00E+00	2.59E-09	0.00E+00
SQP	dimensionless	1.13E+02	0.00E+00	1.54E+00	0.00E+00	5.46E+00	0.00E+00
PM	Disease incidence	5.71E-06	0.00E+00	1.39E-08	0.00E+00	1.72E-08	0.00E+00
IRP	kBq U235 eq	1.18E+00	0.00E+00	1.85E-03	0.00E+00	3.89E-03	0.00E+00

See table 8 for additional information

Table 8 Resource Use and other environmental flows -LLT

	Product stage	End of life stage				Resource recovery stage
	A1-A3	C1	C2	C3	C4	D
	Production	De-construction demolition	Transport	Waste processing	Disposal	Reuse, Recovery, Recycling
Resource Use	**Unit**					
PERE	MJ_{NCV}	2.14E+01	0.00E+00	2.71E-02	0.00E+00	5.14E-02	MNR
PERM	MJ_{NCV}	1.19E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MNR
PERT	MJ_{NCV}	3.33E+01	0.00E+00	2.71E-02	0.00E+00	5.14E-02	MNR
PENRE	MJ_{NCV}	3.24E+02	0.00E+00	2.07E+00	0.00E+00	2.48E+00	MNR
PENRM	MJ_{NCV}	1.39E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MNR
PENRT	MJ_{NCV}	4.63E+02	0.00E+00	2.07E+00	0.00E+00	2.48E+00	MNR
SM	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MNR
RSF	MJ_{NCV}	9.43E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MNR
NRSF	MJ_{NCV}	6.64E+01	0.00E+00	1.20E+00	0.00E+00	0.00E+00	MNR
FW	m^3	1.22E-01	0.00E+00	1.32E-04	0.00E+00	3.86E-04	MNR
Waste	**Unit**					
HWD	kg	1.87E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MNR
NHWD	kg	1.17E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MNR
RWD	kg	5.17E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MNR
Outputs	**Unit**					
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MNR
MFR	kg	1.14E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MNR
MER	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MNR
EE	M_{jpec}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MNR

See table 8 for additional information

Table 18 Biogenic Carbon at Factory Gate (A1-A3)

Biogenic Carbon	*Unit*	*LLT*
Biogenic carbon content in product	*Kg C[3]*	0
Biogenic carbon content in accompanying	*Kg C*	0.7587

[3] 1 kg biogenic carbon is equivalent to 44/12 kg of CO2.

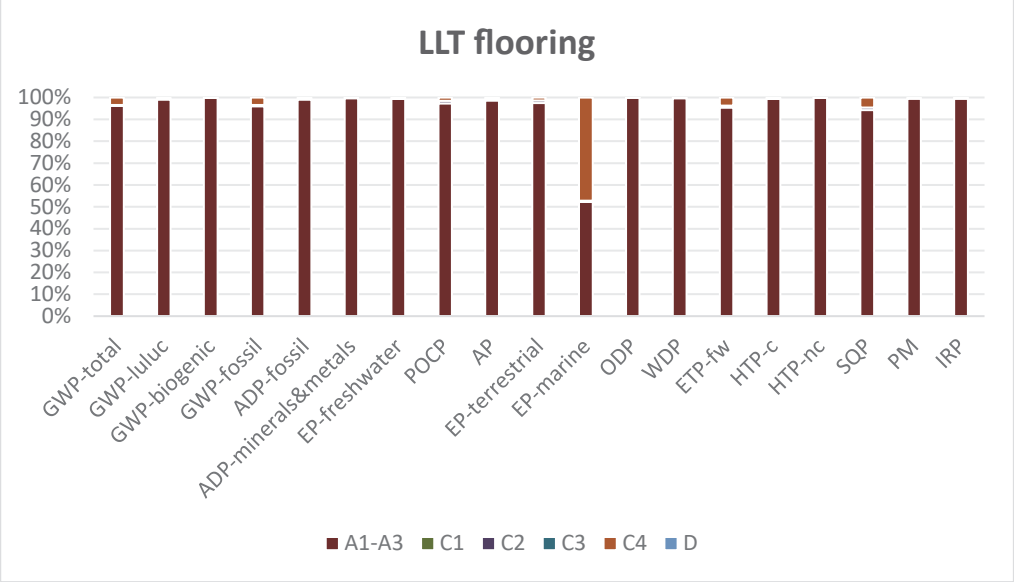

Figure 5. LLT flooring each stage contribution to LCA results

For the indicator EP-marine, the high contribution of the C4 phase compared to other indicators is due to direct emissions such as total organic carbon during waste disposal (treatment of waste plastic, mixture, sanitary landfill).

The wastewater generated from the used water is divided into two parts. One part needs to be discharged after WWT wastewater treatment, and the other part is directly discharged into the municipal wastewater system. Therefore this part is not included in the inventory.

The LCA study has been carried out based on available data, information, regional and global knowledge and experience to achieve more possible accuracy, completeness and representative of the results.