

Statement of Verification

BREG EN EPD No.: 000551

Issue 01

This is to verify that the
Environmental Product Declaration
provided by:
Barrisol Normalu SAS



is in accordance with the requirements of:
EN 15804:2012+A2:2019
and
BRE Global Scheme Document SD207

This declaration is for:
1 m2 Biosourcé BOS01 biopolymer

Company Address

Barrisol Normalu SAS
Kembs Site
Routes du Sipes,
68680 Kembs,
France



Signed for BRE Global Ltd

Emma Baker
Operator

29 January 2024
Date of this Issue

29 January 2024
Date of First Issue

29 January 2029
Expiry Date



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Environmental Product Declaration

EPD Number: 000551

General Information

EPD Programme Operator	Applicable Product Category Rules
BRE Global Watford, Herts WD25 9XX United Kingdom	BRE Environmental Profiles 2022 Product Category Rules for Type III environmental product declaration of construction products to EN 15804+A2 PN 514 Rev 3.0
Commissioner of LCA study	LCA consultant/Tool
Barrisol Normalu SAS Kembs Site Routes du Sipes, 68680 Kembs, France	Flavie Lowres, BRE/Simapro
Declared Unit	Applicability/Coverage
1 m ² Biosourcé BOS01 biopolymer	Product Specific.
EPD Type	Background database
Cradle to Gate with options	Ecoinvent 3.8
Demonstration of Verification	
CEN standard EN 15804 serves as the core PCR ^a	
Independent verification of the declaration and data according to EN ISO 14025:2010 <input type="checkbox"/> Internal <input checked="" type="checkbox"/> External	
(Where appropriate ^b)Third party verifier: Roger Connick	
a: Product category rules b: Optional for business-to-business communication; mandatory for business-to-consumer communication (see EN ISO 14025:2010, 9.4)	
Comparability	
Environmental product declarations from different programmes may not be comparable if not compliant with EN 15804:2012+A2:2019. Comparability is further dependent on the specific product category rules, system boundaries and allocations, and background data sources. See Clause 5.3 of EN 15804:2012+A2:2019 for further guidance	

Information modules covered

Product			Construction		Use stage							End-of-life				Benefits and loads beyond the system boundary
					Related to the building fabric					Related to the building						
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Raw materials supply	Transport	Manufacturing	Transport to site	Construction – Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction demolition	Transport	Waste processing	Disposal	Reuse, Recovery and/or Recycling potential
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Note: Ticks indicate the Information Modules declared.

Manufacturing site(s)

The Biosourcé product is manufactured at the following site:

Barrisol Normalu SAS
 Kembs Site
 Routes du Sipes, 68680 Kembs, France

Construction Product:

Product Description

Barrisol Normalu SAS manufactures stretched ceiling. Biosourcé BOS01 is made using a biopolymer film. Each stretched ceiling is cut to size for the specific project where the product will be installed.

This EPD concerns installation of 1m² Barrisol stretched ceiling, Biosourcé BOS01 biopolymer– which can be backlit, printed or perforated for acoustic. The biopolymer film is without phthalate and contains no lead or cadmium.

All Biosourcé ceilings produced in Normalu Barrisol have CE mark. Barrisol’s stretched ceiling can be installed in all building types (public and private including housing) and events. Barrisol’s products are also IMO certified for use in boats if requested by the customer.

Biosourcé BOS01 biopolymer is 100% recyclable.

The product service life is 40 years according to the supplier’s information.

Technical Information

	Property	Standard	Value, Unit
Biosourcé BOS01 Biopolymer film	Thickness	N/A	0.18 mm +/- 10%
	Density	N/A	250 g/m ² +/- 10%
	VOC classified	NF EN ISO 16000-11 NF EN ISO 16000-9 NF ISO 16000-6 NF ISO 16000-3	A+
	Moisture resistance	N/A	100%
	REACH compliant		
	Phtalate free	NF EN ISO 14389	<0.1%
	CE marking	EN 14716: 2004	Certificate N°0071-CPR-14627
Biosourcé BOS01 installed system	Acoustic performances	ISO 354 DIN EN ISO 11654 ASTM C 423	$\alpha_w = 0.65$ (membrane without insulation) up to $\alpha_w = 1.0$ (with adapted acoustic insulation, insulation not considered in this EPD)
	Reaction to fire	NF EN 11925-2 NF EN 13823	B-s1, d0 – Class 1
	IMO certification	Regulation 2018/773 – certificate of conformity (module B+ module F) IMO res MSC.61 (67) -(FTP code), Annex 1 part 5, and annex 2 IMO MSC / Circ 1120 IMO Res. MSC.307(88)-(2010 FTP Code) Section 8	
	GREENGUARD GOLD	Certificate number : 307209-420	
Origine France warranty	Certificate N° 6039707 .	This label confirm geographical origin of labelled products : “stretch ceilings and walls solutions”	 BVCert. 6039707 Plafond tendu
WWF		Member of France's Club Entreprendre pour la Planète. Barrisol has been protecting the environment for over 50 years by promoting 100% recyclable solutions and some made of recycled materials. See: https://barrisol.com/fr/actualites/2021/barrisol-membre-du-club-entreprendre-pour-la-planete-du-wwf-france	 Le Club PME du WWF France



Further information on the technical performance of Biosourcé BOS01 can be found on Barrisol's website: [Barrisol The bio-based - Details](#) or on demand to the manufacturer.

Main Product Contents

The ceiling film Biosourcé BOS01 film is made of:

Material/Chemical Input	%
Polymer	40-60%
Bio-Plasticizer	20-30%
Stabilizer	<3%
Fire retardant	10-20%
Pigment	8-12%

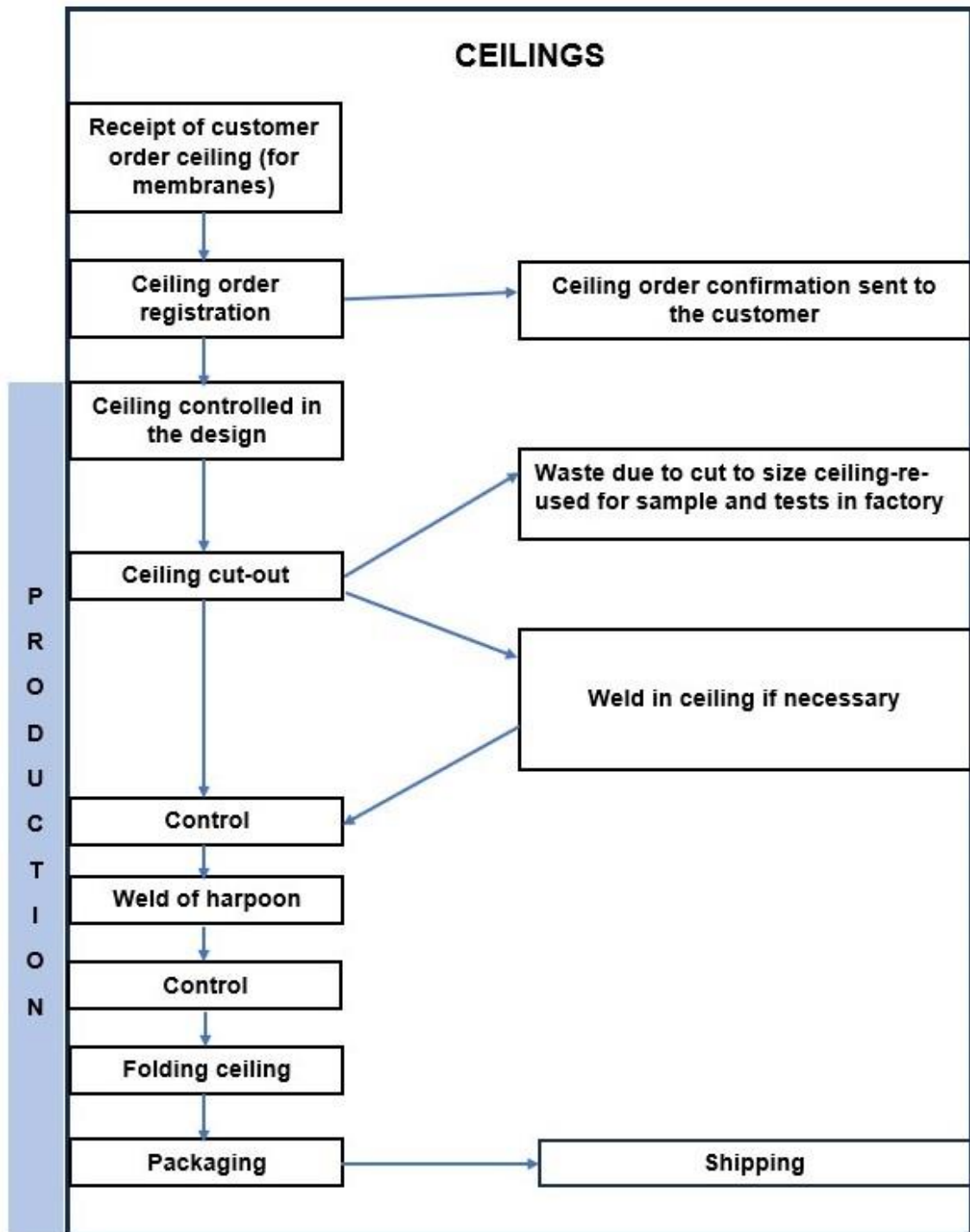
Manufacturing Process

Rolls of Biosourcé BOS01 biopolymer film are brought to site where the fabric is measured, sometimes printed, cut to size and welded with perimeter harpoon.

The required amount of Biosourcé BOS01 stretched ceiling is packaged for installation on site.

Process flow diagram

BARRISOL Process Flow Diagram



Construction Installation

Products are manufactured in France. 40% is used in France and the rest is mostly installed in buildings in Europe.

The installation of Biosourcé BOS01 biopolymer requires the use of heat to ensure the ceiling system is stretched appropriately. There is no waste from the biopolymer film which is cut to size in the factory.

Use Information

B1: the Biosourcé BOS01 biopolymer stretched ceiling system has an A+ rating for indoor air quality. There are no emissions during its life.

End of Life

C1: the Biosourcé BOS01 biopolymer stretched ceiling system is taken down manually

C2: all elements of the system can be disassembled and recycled through commonly available waste management processing plant

C3: no processing is required

C4: the Biosourcé BOS01 biopolymer stretched ceiling film can be recycled although this is not yet common practice. Barrisol includes a clause in their contract with distributors that requires that any Barrisol ceiling should be recycled at end of life. For the purpose of this EPD, it was assumed that 27% of the biopolymer film was recycled as this is a generic value provided by Vinyl Plus's report.

Life Cycle Assessment Calculation Rules

Declared unit description

1 m² Biosourcé BOS01 biopolymer

System boundary

In accordance with the modular approach as defined in EN15804:2012+A2:2019, this cradle-to-grave EPD includes the processes covered in the manufacturing site and product stage A1 to A3, A4, A5, B1, C1 to C4 and D.

Data sources, quality and allocation

Specific primary data derived from the Biosourcé BOS01 production process in the Kembs, Routes du Sipes, 68680 Kembs (France) factory, have been modelled using Simapro v9.4 LCA software and the ecoinvent 3.8 database for the period (01/01/2021 to 31/12/2021). In accordance with the requirements of EN15804, the most current available data has been used. Specific primary data from the supplier of the biopolymer film were also used. The manufacturer-specific data for the biopolymer film covers a period of one year (30/11/2021 – 30/11/2022). Benzoic acid (from plant resin) was used as a proxy for the bio-plasticizer. Secondary data has been obtained for all remaining upstream and downstream processes that are beyond the control of the manufacturer from the ecoinvent 3.8 database. All ecoinvent datasets are complete within the context used and conform to the system boundary and the criteria for the exclusion of inputs and outputs, according to the requirements specified in EN15804. Biosourcé BOS01 is not the only product to be processed at the Kembs factory. All input data provided for Barrisol's factory have been allocated by m² to Biosourcé BOS01.

Quality Level Geographical

Specific French datasets have been selected from the ecoinvent LCI for French hydro electricity. The quality level of geographical and technical representativeness is therefore good. The quality level of time representativeness is good as the background LCI datasets are based on ecoinvent v3.8 which was compiled in 2021. Therefore, the most appropriate LCA data have been used.

Barrisol's factory is in proximity of a hydro electricity plant. The GWP of the dataset used for this EPD is: 1 kWh hydro electricity (Electricity, high voltage {FR} electricity production, hydro, reservoir, alpine region EN15804, U) = 6.51E-03 kgCO₂eq

In order to meet the requirements of BRE's PCR, the A1-A3 data have also been modelled using the French electricity dataset; 1 kWh French electricity (Electricity, medium voltage {FR} market for electricity, medium voltage EN15804, U) = 8.66E-02 kgCO₂eq

Cut-off criteria

The study includes the manufacturing of the biopolymer film and fabrication of the stretched ceiling film in Barrisol's factory in Kembs. This EPD does not include the fixings that would be required to install the stretched ceiling.

LCA Results – 1 m² Biosourcé BOS01 Biopolymer film – hydro electricity

Parameters describing environmental impacts			GWP-total	GWP-fossil	GWP-biogenic	GWP-luluc	ODP	AP	EP-freshwater
			kg CO ₂ eq	kg CO ₂ eq	kg CO ₂ eq	kg CO ₂ eq	kg CFC11 eq	mol H ⁺ eq	kg (PO ₄) ³⁻ eq
Product stage	Raw material supply	A1	9.49E-01	9.33E-01	1.41E-02	9.70E-04	2.12E-07	1.10E-02	3.31E-03
	Transport	A2	2.45E-02	2.45E-02	8.24E-05	9.60E-06	5.66E-09	9.93E-05	1.64E-06
	Manufacturing	A3	2.65E-01	3.22E-01	-5.87E-02	1.03E-03	2.15E-08	1.05E-03	9.43E-05
	Total	A1-3	1.24E+00	1.28E+00	-4.45E-02	2.01E-03	2.39E-07	1.21E-02	3.41E-03
Construction process stage	Transport	A4	6.26E-02	6.23E-02	2.10E-04	2.45E-05	1.44E-08	2.53E-04	4.19E-06
	Construction	A5	1.39E-01	1.38E-01	4.15E-04	5.84E-05	1.34E-08	4.55E-04	2.58E-05
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Market Scenario – 27% recycled at end of life. Barrisol has a program to recycle biopolymer film									
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	2.09E-03	2.08E-03	7.00E-06	8.16E-07	4.81E-10	8.44E-06	1.40E-07
	Waste processing	C3	9.62E-03	4.21E-03	5.20E-03	6.91E-06	2.21E-10	1.74E-05	1.54E-06
	Disposal	C4	4.24E-01	4.21E-01	1.95E-03	2.00E-04	6.79E-08	7.14E-04	5.42E-05
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.69E-01	-1.67E-01	-1.70E-03	-1.63E-04	-7.74E-08	-7.75E-04	-4.91E-05

GWP-total = Global warming potential, total;
 GWP-fossil = Global warming potential, fossil;
 GWP-biogenic = Global warming potential, biogenic;
 GWP-luluc = Global warming potential, land use and land use change;

ODP = Depletion potential of the stratospheric ozone layer;
 AP = Acidification potential, accumulated exceedance; and
 EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment

For info: LCA Results – 1 m² Biosourcé BOS01 Biopolymer film if Barrisol used the French electricity mix

Parameters describing environmental impacts			GWP-total	GWP-fossil	GWP-biogenic	GWP-luluc	ODP	AP	EP-freshwater
			kg CO ₂ eq	kg CO ₂ eq	kg CO ₂ eq	kg CO ₂ eq	kg CFC11 eq	mol H ⁺ eq	kg (PO ₄) ³⁻ eq
Product stage	Raw material supply	A1	9.49E-01	9.33E-01	1.41E-02	9.70E-04	2.12E-07	1.10E-02	3.31E-03
	Transport	A2	2.45E-02	2.45E-02	8.24E-05	9.60E-06	5.66E-09	9.93E-05	1.64E-06
	Manufacturing	A3	3.82E-01	4.31E-01	-5.09E-02	1.09E-03	3.33E-08	1.60E-03	1.28E-04
	Total	A1-A3	1.36E+00	1.39E+00	-3.67E-02	2.07E-03	2.51E-07	1.27E-02	3.44E-03

LCA Results (continued) – 1 m² Biosourcé BOS01 Biopolymer film – hydro electricity

Parameters describing environmental impacts			EP-marine	EP-terrestrial	POCP	ADP-mineral&metals	ADP-fossil	WDP	PM
			kg N eq	mol N eq	kg NMVOC eq	kg Sb eq	MJ, net calorific value	m ³ world eq deprived	disease incidence
Product stage	Raw material supply	A1	1.92E-03	2.49E-02	5.84E-03	3.43E-02	2.08E+01	9.82E-01	7.36E-08
	Transport	A2	2.99E-05	3.27E-04	1.00E-04	8.47E-08	3.70E-01	1.11E-03	2.11E-09
	Manufacturing	A3	4.89E-04	3.16E-03	8.92E-04	1.05E-06	3.61E+00	4.43E-01	1.53E-08
	Total	A1-3	2.44E-03	2.84E-02	6.83E-03	3.43E-02	2.48E+01	1.43E+00	9.10E-08
Construction process stage	Transport	A4	7.63E-05	8.33E-04	2.55E-04	2.16E-07	9.42E-01	2.82E-03	5.38E-09
	Construction	A5	1.24E-04	1.29E-03	4.68E-04	8.28E-07	1.59E+00	1.34E-02	7.96E-09
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Market Scenario – 27% recycled at end of life. Barrisol has a program to recycle biopolymer film									
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	2.54E-06	2.78E-05	8.50E-06	7.20E-09	3.14E-02	9.41E-05	1.79E-10
	Waste processing	C3	8.88E-06	5.02E-05	1.63E-05	6.47E-08	3.27E-02	9.62E-04	3.51E-10
	Disposal	C4	1.62E-04	1.64E-03	4.43E-04	1.58E-06	1.49E+00	1.12E-01	5.88E-09
Potential benefits and loads beyond the system	Reuse, recovery, recycling potential	D	-1.53E-04	-1.52E-03	-5.00E-04	-2.53E-06	-3.61E+00	-1.16E-01	-7.09E-09

EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment;
 EP-terrestrial = Eutrophication potential, accumulated exceedance;
 POCP = Formation potential of tropospheric ozone;
 ADP-mineral&metals = Abiotic depletion potential for non-fossil resources;

ADP-fossil = Depletion potential of the stratospheric ozone layer;
 WDP = Water (user) deprivation potential, deprivation-weighted water consumption; and
 PM = Particulate matter.

For info: LCA Results – 1 m² Biosourcé BOS01 Biopolymer film if Barrisol used the French electricity mix

Parameters describing environmental impacts			EP-marine	EP-terrestrial	POCP	ADP-mineral & metals	ADP-fossil	WDP	PM
			kg N eq	mol N eq	kg NMVOC eq	kg Sb eq	MJ, net calorific value	m ³ world eq deprived	disease incidence
Product stage	Raw material supply	A1	1.92E-03	2.49E-02	5.84E-03	3.43E-02	2.08E+01	9.82E-01	7.36E-08
	Transport	A2	2.99E-05	3.27E-04	1.00E-04	8.47E-08	3.70E-01	1.11E-03	2.11E-09
	Manufacturing	A3	6.33E-04	4.20E-03	1.17E-03	2.17E-06	2.04E+01	1.84E-01	2.09E-08
	Total	A1-A3	2.59E-03	2.94E-02	7.11E-03	3.43E-02	4.16E+01	1.17E+00	9.66E-08

LCA Results (continued) – 1 m² Biosourcé BOS01 Biopolymer film – hydro electricity

Parameters describing environmental impacts			IRP	ETP-fw	HTP-c	HTP-nc	SQP
			kBq U ²³⁵ eq	CTUe	CTUh	CTUh	dimensionless
Product stage	Raw material supply	A1	2.59E-01	2.80E+02	2.20E-09	9.37E-08	6.11E+00
	Transport	A2	1.90E-03	2.88E-01	9.36E-12	3.03E-10	2.54E-01
	Manufacturing	A3	2.42E-02	3.95E+00	1.43E-10	2.64E-09	7.30E+00
	Total	A1-3	2.85E-01	2.84E+02	2.35E-09	9.67E-08	1.37E+01
Construction process stage	Transport	A4	4.84E-03	7.35E-01	2.39E-11	7.72E-10	6.47E-01
	Construction	A5	4.94E-03	2.13E+00	3.64E-10	2.40E-09	4.94E-01
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Market Scenario - 27% recycled at end of life. Barrisol has a program to recycle biopolymer film							
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	1.61E-04	2.45E-02	7.96E-13	2.57E-11	2.16E-02
	Waste processing	C3	3.67E-04	4.22E-01	1.47E-11	1.14E-10	6.40E-02
	Disposal	C4	1.54E-02	2.85E+01	1.57E-10	7.01E-09	4.32E-01
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.14E-02	-3.29E+00	-1.06E-10	-2.91E-09	-4.37E-01

IRP = Potential human exposure efficiency relative to U235;
ETP-fw = Potential comparative toxic unit for ecosystems;
HTP-c = Potential comparative toxic unit for humans;

HTP-nc = Potential comparative toxic unit for humans; and
SQP = Potential soil quality index.

For info: LCA Results – 1 m² Biosourcé BOS01 Biopolymer film if Barrisol used the French electricity mix

			IRP	ETP-fw	HTP-c	HTP-nc	SQP
			kBq U ²³⁵ eq	CTUe	CTUh	CTUh	dimensionless
Product stage	Raw material supply	A1	2.59E-01	2.80E+02	2.20E-09	9.37E-08	6.11E+00
	Transport	A2	1.90E-03	2.88E-01	9.36E-12	3.03E-10	2.54E-01
	Manufacturing	A3	7.98E-01	7.53E+00	1.93E-10	3.99E-09	7.88E+00
	Total	A1-A3	1.06E+00	2.87E+02	2.40E-09	9.80E-08	1.43E+01

LCA Results (continued) – 1 m² Biosourcé BOS01 Biopolymer film – hydro electricity

Parameters describing resource use, primary energy			PERE	PERM	PERT	PENRE	PENRM	PENRT
			MJ	MJ	MJ	MJ	MJ	MJ
Product stage	Raw material supply	A1	1.21E+00	1.90E-01	1.40E+00	1.60E+01	4.75E+00	2.07E+01
	Transport	A2	5.21E-03	0.00E+00	5.21E-03	3.63E-01	0.00E+00	3.63E-01
	Manufacturing	A3	4.79E+00	2.33E+00	7.12E+00	9.56E-01	2.66E+00	3.62E+00
	Total	A1-3	6.01E+00	2.52E+00	8.52E+00	1.73E+01	7.42E+00	2.47E+01
Construction process stage	Transport	A4	1.33E-02	0.00E+00	1.33E-02	9.25E-01	0.00E+00	9.25E-01
	Construction	A5	5.54E-02	0.00E+00	5.54E-02	1.38E+00	0.00E+00	1.38E+00
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Market Scenario - 27% recycled at end of life. Barrisol has a program to recycle biopolymer film								
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	4.42E-04	0.00E+00	4.42E-04	3.08E-02	0.00E+00	3.08E-02
	Waste processing	C3	4.03E-03	0.00E+00	4.03E-03	-1.52E+00	1.55E+00	3.25E-02
	Disposal	C4	1.73E-01	0.00E+00	1.73E-01	-2.44E+00	3.93E+00	1.49E+00
Potential benefits and loads beyond the system	Reuse, recovery, recycling potential	D	-1.68E-01	0.00E+00	-1.68E-01	-1.96E+00	-1.45E+00	-3.42E+00

PERE = Use of renewable primary energy excluding renewable primary energy used as raw materials;
 PERM = Use of renewable primary energy resources used as raw materials;
 PERT = Total use of renewable primary energy resources;

PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials;
 PENRM = Use of non-renewable primary energy resources used as raw materials;
 PENRT = Total use of non-renewable primary energy resource

For info: LCA Results – 1 m² Biosourcé BOS01 Biopolymer film if Barrisol used the French electricity mix

			PERE	PERM	PERT	PENRE	PENRM	PENRT
			MJ	MJ	MJ	MJ	MJ	MJ
Product stage	Raw material supply	A1	1.21E+00	1.90E-01	1.40E+00	1.60E+01	4.75E+00	2.07E+01
	Transport	A2	5.21E-03	0.00E+00	5.21E-03	3.63E-01	0.00E+00	3.63E-01
	Manufacturing	A3	4.12E-01	2.33E+00	2.74E+00	1.78E+01	2.66E+00	2.04E+01
	Total	A1-A3	1.62E+00	2.52E+00	4.14E+00	3.41E+01	7.42E+00	4.15E+01

LCA Results (continued) – 1 m² Biosourcé BOS01 Biopolymer film – hydro electricity

Parameters describing resource use, secondary materials and fuels, use of water						
			SM	RSF	NRSF	FW
			kg	MJ net calorific value	MJ net calorific value	m ³
Product stage	Raw material supply	A1	1.57E-02	5.87E-04	0.00E+00	1.88E-02
	Transport	A2	1.22E-04	1.34E-06	0.00E+00	4.12E-05
	Manufacturing	A3	1.63E-01	1.17E-02	0.00E+00	4.60E-02
	Total	A1-3	1.79E-01	1.23E-02	0.00E+00	6.48E-02
Construction process stage	Transport	A4	3.10E-04	3.42E-06	0.00E+00	1.05E-04
	Construction	A5	7.88E-03	8.74E-06	0.00E+00	4.64E-04
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Market Scenario - 27% recycled at end of life. Barrisol has a program to recycle biopolymer film						
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	1.03E-05	1.14E-07	0.00E+00	3.50E-06
	Waste processing	C3	2.24E-04	1.77E-06	0.00E+00	3.32E-05
	Disposal	C4	4.63E-04	2.64E-05	0.00E+00	3.03E-03
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-6.01E-04	-6.28E-06	0.00E+00	-2.30E-03

SM = Use of secondary material;
RSF = Use of renewable secondary fuels;

NRSF = Use of non-renewable secondary fuels;
FW = Net use of fresh water

For info: LCA Results – 1 m² Biosourcé BOS01 Biopolymer film if Barrisol used the French electricity mix

			SM	RSF	NRSF	FW
			kg	MJ net calorific value	MJ net calorific value	m ³
Product stage	Raw material supply	A1	1.57E-02	5.87E-04	0.00E+00	1.88E-02
	Transport	A2	1.22E-04	1.34E-06	0.00E+00	4.12E-05
	Manufacturing	A3	1.63E-01	1.17E-02	0.00E+00	7.95E-03
	Total	A1-A3	1.79E-01	1.23E-02	0.00E+00	2.68E-02

LCA Results (continued) – 1 m² Biosourcé BOS01 Biopolymer film – hydro electricity

Other environmental information describing waste categories					
			HWD	NHWD	RWD
			kg	kg	kg
Product stage	Raw material supply	A1	1.30E-01	1.53E+01	8.20E-05
	Transport	A2	4.07E-04	7.23E-03	2.50E-06
	Manufacturing	A3	1.17E-02	3.56E-01	9.59E-06
	Total	A1-3	1.42E-01	1.57E+01	9.41E-05
Construction process stage	Transport	A4	1.04E-03	1.84E-02	6.37E-06
	Construction	A5	1.82E-02	1.00E-01	4.17E-06
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00
Market Scenario - 27% recycled at end of life. Barrisol has a program to recycle biopolymer film					
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	3.46E-05	6.14E-04	2.12E-07
	Waste processing	C3	7.47E-04	1.06E-02	1.55E-07
	Disposal	C4	1.84E-02	4.34E-01	5.91E-06
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.20E-02	-2.13E-01	-4.49E-06

HWD = Hazardous waste disposed;
 NHWD = Non-hazardous waste disposed;
 RWD = Radioactive waste disposed

For info: LCA Results – 1 m² Biosourcé BOS01 Biopolymer film if Barrisol used the French electricity mix

			HWD	NHWD	RWD
			kg	kg	kg
Product stage	Raw material supply	A1	1.30E-01	1.53E+01	8.20E-05
	Transport	A2	4.07E-04	7.23E-03	2.50E-06
	Manufacturing	A3	2.04E-02	4.71E-01	2.34E-04
	Total	A1-A3	1.51E-01	1.58E+01	3.18E-04

LCA Results (continued) – 1 m² Biosourcé BOS01 Biopolymer film – hydro electricity

Other environmental information describing output flows – at end of life								
			CRU	MFR	MER	EE	Biogenic carbon (product)	Biogenic carbon (packaging)
			kg	kg	kg	MJ per energy carrier	kg C	kg C
Product stage	Raw material supply	A1	0.00E+00	8.15E-04	9.44E-07	1.76E-02	0.00E+00	-5.42E-03
	Transport	A2	0.00E+00	1.12E-06	9.09E-09	7.79E-05	0.00E+00	0.00E+00
	Manufacturing	A3	0.00E+00	3.92E-02	4.77E-07	2.88E-02	0.00E+00	-7.84E-02
	Total	A1-A3	0.00E+00	4.00E-02	1.43E-06	4.65E-02	0.00E+00	8.32E-02
Construction process stage	Transport	A4	0.00E+00	2.86E-06	2.32E-08	1.99E-04	0.00E+00	0.00E+00
	Construction	A5	0.00E+00	6.45E-06	2.82E-07	6.06E-04	0.00E+00	0.00E+00
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Market Scenario - 27% recycled at end of life. Barrisol has a program to recycle biopolymer film								
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	0.00E+00	9.55E-08	7.72E-10	6.62E-06	0.00E+00	9.14E-10
	Waste processing	C3	0.00E+00	6.17E-02	2.34E-08	4.24E-03	0.00E+00	6.17E-02
	Disposal	C4	0.00E+00	1.31E-05	1.56E-07	1.34E-03	0.00E+00	7.87E-07
Potential benefits and loads beyond the system	Reuse, recovery, recycling potential	D	0.00E+00	-1.63E-05	-1.19E-07	-1.60E-03	0.00E+00	0.00E+00

CRU = Components for reuse;
MFR = Materials for recycling

MER = Materials for energy recovery;
EE = Exported Energy

For info: LCA Results – 1 m² Biosourcé BOS01 Biopolymer film if Barrisol used the French electricity mix

			CRU	MFR	MER	EE	Biogenic carbon (product)	Biogenic carbon (packaging)
			kg	kg	kg	MJ per energy	kg C	kg C
Product stage	Raw material supply	A1	0.00E+00	8.15E-04	9.44E-07	1.76E-02	0.00E+00	-5.42E-03
	Transport	A2	0.00E+00	1.12E-06	9.09E-09	7.79E-05	0.00E+00	0.00E+00
	Manufacturing	A3	0.00E+00	3.93E-02	5.16E-07	3.19E-02	0.00E+00	-7.84E-02
	Total	A1-A3	0.00E+00	4.01E-02	1.47E-06	4.96E-02	0.00E+00	-8.38E-02

Scenarios and additional technical information

Scenarios and additional technical information			
Scenario	Parameter	Units	Results
A4 – Transport to the building site	40% of the Barrisol Biosourcé BOS01 is used in France and the majority of the rest is used in Europe. For the purpose of this EPD, we have assumed the worst case scenario of 1500 km by road		
	Fuel type / Vehicle type	Litre of diesel for the distance	340
	Distance:	km	1500
	Capacity utilisation (incl. empty returns)	%	26%
	Bulk density of transported products – Biosourcé BOS01	kg/m ²	0.25
A5 – Installation in the building	The installation of Biosourcé BOS01 requires the use of heat (propane or electric heater depending on the project requirements) to ensure the ceiling system is stretched appropriately. For the purpose of this study, it was assumed that propane was used. There is no waste from the biopolymer film which is cut to size in the factory.		
	Use of heat for the installation, for a 10 m ² system		
	Propane.	kg	0.8
	screws	kg	0.021
B1 – Use	The Biosourcé BOS01 ceiling system has an A+ rating for indoor air quality		
C1 - Deconstruction	The Biosourcé BOS01 ceiling system is taken down manually		
C2 - Transport from site to pre-processing facility or landfill	All elements of the system can be disassembled and recycled through commonly available waste management processing plant		
	Transport by lorry to recycling plant	km	50
C3 - Pre-processing of uninstalled product (if relevant)	Processing of biopolymer through waste management facilities		
C4 – Disposal	The biopolymer film can be recycled. Barrisol includes a clause in their contract with distributors that requires that any Barrisol ceiling should be recycled at end of life. For the purpose of this EPD, it was assumed that 27% of polymer was recycled as this was a generic value provided by Vinyl Plus' report.		
	Recycling rate of Biosourcé BOS01	%	27
Module D - Benefits and loads beyond the system	The Biosourcé BOS01 biopolymer film can be recycled at the Barrisol factory to make further biopolymer film		

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- NF EN 13823:2020+A1:2022 - Reaction to fire tests for building products. Building products excluding floorings exposed to the thermal attack by a single burning item
- Vinyl plus report – Progress Report 2022 – reporting on 2021 activities – Vinyl Plus [Progress Report 2022 – VinylPlus](#)

Appendix - interpretation of results and further analysis

40-60% of the input by mass is the biopolymer, 20-30% is the plasticizer, 10-20% is from the fire retardant and 8-12% from the pigment. 28% of the impact in GWP total is associated with the biopolymer, 24% is from the flame retardant and 15% is from the pigment and from the plasticizer respectively. Less than 10% of the impact is GWP are associated with the use of energy to make the biopolymer film. 77% of the impact of the stretched ceiling (A1 to A3) is from the manufacturing of the biopolymer film

Graphical representation of the results

