Environmental Product Declaration

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

Resilient acoustic Underscreed U36 [6/3] and [8/4]

from

Amorim Cork Composites, S.A.

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General information

Programme information

Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
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Accountabilities for PCR, LCA and independent, third-party verification
Product Category Rules (PCR)
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): *PCR 2019:14 Construction Products, Version 1.2.5 and C-PCR-014 (TO PCR 2019:14) Acoustical Ceiling and Wall Solutions, version 2022-01-28*
PCR review was conducted by: *The Technical Committee of the International EPD® System.*
Life Cycle Assessment (LCA)
LCA accountability: *Maria Inês Vitória dos Santos, Itecons – Institute for Research and Technological Development in Construction, Energy, Environment and Sustainability*
Third-party verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☒ EPD verification by individual verifier Third-party verifier Elisabet Amat, GREENIZE Approved by: The International EPD® System
Procedure for follow-up of data during EPD validity involves third party verifier: ☐ Yes ☒ No

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

Company information

Owner of the EPD:
Amorim Cork Composites, S.A.
Contact:
Joana Trindade
info.as@amorim.com

Description of the organisation:
Amorim Cork N (ACC) is Corticeira Amorim's most technologically advanced area. Internationally renowned for its R&D credentials, the company's pioneering spirit – coupled with cork's unique properties – has made it possible to deliver a remarkable range of high-performance, state-of-the-art products; a veritable new universe in cork, which doesn't just meet current demands but also anticipates tomorrow's trends and markets.

Product-related or management system-related certifications:

ACC has a management system that integrates the different normative references:

- Quality according to the NP EN ISO 9001 standard;
- Environment according to the NP EN ISO 14001 standard;
- Security according to the ISO 450001 standard;
- Energy according to the NP EN ISO 50001 standard
- Forest sustainability (chain of custody) according to Standard FSC-STD-40-004;
- Forest sustainability (chain of custody) According to Norm PEFC ST 2002;
- System code according to CIPR (International Code of Cork Stopper Practices).

Name and location of production site(s):

Amorim Cork Composite, S.A.
Rua Comendador Américo Ferreira Amorim, 260
4535-186 Mozelos
Santa Maria da Feira
Portugal
https://amorimcorkcomposites.com/pt/

Product information

Product name:
Resilient Acoustic Underscreed U36 [6/3] and [8/4]

Product identification:
Resilient acoustic underscreeds

Product description:
Underscreeds U36 are products composed of agglomerated natural cork blended with high-density PU and EVA (circular materials – pre-consumer waste). These products are resilient sublayers applied on the floor, between the structural slab and the screed, during the construction process. The application of an underscreed intend to improve the acoustic insulation of a building by reducing the spreading of percussion or impact noise. This system also influences the reduction of aerial noise (airborne sound) and the thermal performance of the construction, as it helps to restrict heat losses.

Technical product information on Underscreed U36

	Underscreed U36 [6/3]	Underscreed U36 [8/4]	Observations
Reference	U36 [6/3]	U36 [8/4]	
Dimensions (m x m)	1X10	1X10	
Thickness (mm)	6/3	8/4	
Weight (kg/m^2)	2,16	2,76	
Weight- packed (kg/m^2)	2,28	2,89	
Impact noise reduction | ΔL_w (dB)	25	27	as per ISO 10140-3 and ISO 717-2
Impact insulation class | IIC (dB)	53	53	as per ASTM E2179-03, ASTM E492-09, ASTM E989-18 and ASTM E2235-04
Specific Weight (kg/m^3)	370-500		as per ASTMF1315 and ISO 7322
Tensile Strength (KPa)	≥200		as per ASTMF152 and ISO 7322
Cp level (mm)	<1		as per ISO 092/19 and ISO 7322
Thermal Conductivity (W/mK)	0,0751		as per ASTM D297
Fire Classification	E/Efl		as per EN 13501-1 and ISO 11925

UN CPC code:
54650 Insulation services

Geographical scope:
The LCA study was carried out according to the Europe scope.
Product Market: Global

LCA information

Functional unit / declared unit:
1 m^2 of resilient acoustic underscreed installed during 50 years with unclassified sound absorption (packaging included).

Reference service life:
The service life of the building (50 years) was considered, since once installed the product is protected by other elements and does not require maintenance.

Time representativeness:
2021

Database(s) and LCA software used:
- Ecoinvent v3.9.1 and EF database v2.0
- SimaPro v9.5

Data Quality:
Specific data was used based on the average production of Underscreed U36 [6/3] and [8/4] in 2021. For processes which the producer has no influence or specific information, such as the extraction of raw materials, production of customised products and electricity production, generic data was used from Ecoinvent database v3.9.1 and EF database 2.0, considering geographical significance.

Cut-off rules:

The developed LCA includes all available data associated directly to the product stage [A1-A3] and end of life stage [C1-C4]. The following processes were not considered in this study, since they fell on the cut-off criteria of 1% of renewable and non-renewable primary energy usage and 1% of the total mass input of the unit process where they occur, with a maximum of 5% of energy usage and mass per module:

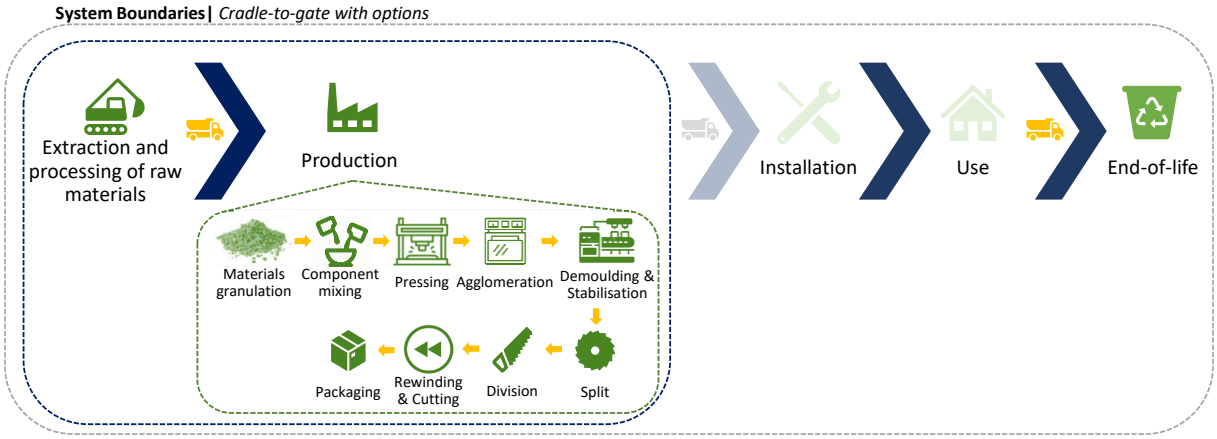
- Construction of industrial infrastructure and equipment manufacturing;
- Maintenance operations of industrial infrastructure and equipment;
- Burdens of infrastructures associated to transportation of pre-products and raw materials;
- Consumption and emissions in administrative areas and laboratories.

Description of system boundaries:

Cradle to gate with options.

This system boundary was defined according to the interpretation of points 4.2.1, 4.2.2 and 4.2.4 of the c-PCR. Through which there is an opening for the definition of other borders of the system.

This EPD covers the information module A1-A3, C1-C4 and D, comprising of the following modules (Figure 3): [A1] raw material extraction and processing, processing of secondary material input; [A2] transport to the manufacturer; [A3] manufacturing; [C2] transport to waste processing; [C3] waste processing for reuse, recovery and/or recycling; [C4] disposal and module D.



Product stage [A1-A3]:

Modules A1-A3 cover the extraction, production and acquisition of the main raw materials and pre-products, as well as electricity and fuel production. Transport of all raw materials considered in module A1 to the factory gate and production of the final products including waste and emissions.

Construction process stage [A4-A5]:

This EPD does not cover the construction process stage. In accordance with the interpretation of points 4.2.1, 4.2.2 and 4.2.4 of the c-PCR.

Use stage [B1-B7]:

This EPD does not cover the use stage. The use stage is not included because these products are resilient sublayers applied on the floor, between the structural slab and the screed, during the construction process. Once installation of underscreed is completed, no actions or maintenance are required during the use stage until the end-of-life stage.

End of life stage [C1-C4]:

Module C1:
The demolition of Underscreeds is associated with the demolition of the building, so the contribution of the demolition of this type of product is considered not relevant.

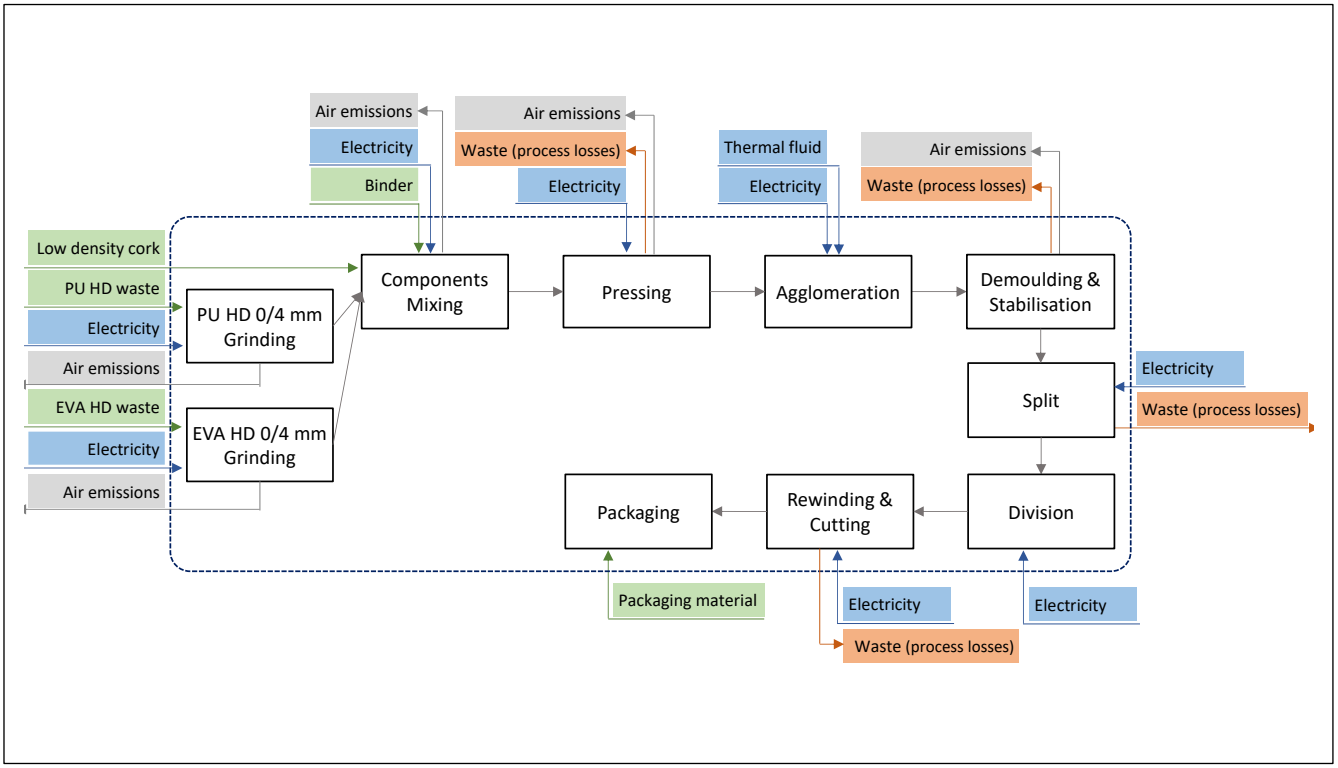
Module C2: In the transport of the Underscreed U36 [6/3] and [8/4] waste, it was considered that the waste operators are within a radius of 50 km.

Module C3: It is considered that the residues of the system are not processed before their disposal.

Module C4: At the end-of-life stage, a scenario of landfill (100 %) was considered, based on EUROSTAT 39/2019 report and primary information from the manufacturer.

Resource recovery stage [D]:
At present there are no processes for re-use or recovery and the potential benefits beyond the system boundaries (D) are therefore zero.

System diagram:



The Underscreed U36 production comprises 11 stages: Low density Cork Grinding (outside ACC facilities), PU HD 0/4 mm Grinding, EVA HD 0/4 mm Grinding, Components Mixing, Pressing, Agglomeration, Demoulding & Stabilisation, Split, Division, Rewinding & Cutting and Packaging.

Modules declared, geographical scope, share of specific data (in GWP-GHG results) and data variation (in GWP-GHG results):

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	**A1**	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Modules declared	x	x	x	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	x	x	x	x
Geography	EU	EU	PT	-	-	-	-	-	-	-	-	-	EU				EU
Specific data used	>90%					-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	36%					-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	-					-	-	-	-	-	-	-	-	-	-	-	-

x: included / ND: not declared / NR: not relevant / PT: Portugal / EU: European.

Content information

U36 [6/3]*

Product components	Weight, kg/m²	Post-consumer material, weight-%	Weight biogenic carbon, kg C/m²
Low density Cork	1,84E-01	0%	8,69E-02
PU HD	1,17E+00	0%	0,00E+00
EVA HD	5,92E-01	0%	0,00E+00
Binder	2,14E-01	0%	0,00E+00
TOTAL	2,16E+00	0%	8,69E-02
Packaging materials	**Weight, kg/m²**	**Weight-% (versus the product)**	**Weight biogenic carbon, kg C/m2**
Plastic film	1,60E-03	0,07%	0,00E+00
Cardboard	1,40E-04	0,01%	9,03E-06
Plastic	4,00E-04	0,02%	0,00E+00
Information leaflet	1,90E-03	0,08%	9,44E-04
Wooden pallet	1,21E-01	5,31%	4,83E-02
TOTAL	1,25E-01	5,48%	4,93E-02

*The product does not contain any substance included in the Candidate List of Substances of Very High Concern (SVHCs) for authorization with concentrations higher than 0.1% weight by weight (w/w).

U36 [8/4]*

Product components	Weight, kg/m²	Post-consumer material, weight-%	Weight biogenic carbon, kg C/m²
Low density Cork	2,36E-01	0%	1,11E-01
PU HD	1,49E+00	0%	0,00E+00
EVA HD	7,59E-01	0%	0,00E+00
Binder	2,74E-01	0%	0,00E+00
TOTAL	2,76E+00	0%	1,11E-01
Packaging materials	**Weight, kg/m²**	**Weight-% (versus the product)**	**Weight biogenic carbon, kg C/m²**
Plastic film	1,60E-03	0,06%	0,00E+00
Cardboard	1,40E-04	0,00%	9,03E-06
Plastic	4,00E-04	0,01%	0,00E+00
Information leaflet	1,90E-03	0,07%	9,44E-04
Wooden pallet	1,21E-01	4,19%	4,83E-02
TOTAL	1,25E-01	4,33%	4,93E-02

*The product does not contain any substance included in the Candidate List of Substances of Very High Concern (SVHCs) for authorization with concentrations higher than 0.1% weight by weight (w/w).

Results of the environmental performance indicators

The results presented in this EPD correspond to the worst case: Resilient acoustic Underscreed U36 [8/4]. To estimate the environmental impacts of Underscreed U36 [6/3], the results can be multiplied by a corresponding factor (see Additional Environmental Information).

Mandatory impact category indicators according to EN 15804

	1 m² U36 [8/4]					
	[A1-A3]	**C1**	**C2**	**C3**	**C4**	**D**
GWP|T (kg CO_2 eq.)	3,23E+00	NR	6,22E-02	0,00E+00	6,82E-01	0,00E+00
GWP|F (kg CO_2 eq.)	3,71E+00	NR	6,22E-02	0,00E+00	2,53E-01	0,00E+00
GWP|B (kg CO_2 eq.)	-4,90E-01	NR	1,86E-05	0,00E+00	4,29E-01	0,00E+00
GWP|L (kg CO_2 eq.)	7,80E-03	NR	1,21E-06	0,00E+00	2,66E-05	0,00E+00
ODP (kg CFC-11 eq.)	8,94E-08	NR	1,33E-09	0,00E+00	2,63E-10	0,00E+00
AP (mol H+ eq.)	1,40E-02	NR	7,50E-05	0,00E+00	2,07E-04	0,00E+00
EP|Fw (kg P eq.)	1,17E-04	NR	4,84E-08	0,00E+00	6,63E-07	0,00E+00
EP|M (kg N eq.)	4,10E-03	NR	1,77E-05	0,00E+00	2,27E-03	0,00E+00
EP|T (mol N eq.)	3,40E-02	NR	1,73E-04	0,00E+00	8,52E-04	0,00E+00
POCP (kg NMVOC eq.)	1,19E-02	NR	1,41E-04	0,00E+00	3,05E-04	0,00E+00
ADP|MM (kg Sb eq.)	7,04E-06	NR	2,12E-09	0,00E+00	8,59E-10	0,00E+00
ADP|F (MJ)	4,30E+01	NR	8,20E-01	0,00E+00	3,25E-01	0,00E+00
WDP (m^3 world eq. deprived)	1,72E+00	NR	7,50E-04	0,00E+00	2,26E-03	0,00E+00
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; 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; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption NR: not relevant					

The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

Additional mandatory impact category indicator

	1 m² U36 [8/4]					
	[A1-A3]	**C1**	**C2**	**C3**	**C4**	**D**
GWP|GHG* (kg CO_2 eq.)	3,72E+00	NR	6,22E-02	0,00E+00	2,53E-01	0,00E+00

**This indicator includes all greenhouse gases of the GWP total, but excludes biogenic carbon dioxide emissions and uptake and biogenic carbon stored in the product. Characterization factors are based on IPCC AR5 (IPCC 2013).*

Resource use indicators

Parameter		Unit	1 m² U36 [8/4] [A1-A3]	C1	C2	C3	C4	D
Primary energy resources – Renewable	Use as energy carrier	MJ, net calorific value	4,36E+01	NR	2,15E-03	0,00E+00	2,16E-02	0,00E+00
	Used as raw materials	MJ, net calorific value	4,98E+00	NR	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	Total	MJ, net calorific value	4,86E+01	NR	2,15E-03	0,00E+00	2,16E-02	0,00E+00
Primary energy resources – Non-renewable	Use as energy carrier	MJ, net calorific value	4,29E+01	NR	8,20E-01	0,00E+00	3,25E-01	0,00E+00
	Used as raw materials	MJ, net calorific value	8,83E-02	NR	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	Total	MJ, net calorific value	4,30E+01	NR	8,20E-01	0,00E+00	3,25E-01	0,00E+00
Secondary material		Kg	1,94E+00	NR	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Renewable secondary fuels		MJ, net calorific value	5,01E+00	NR	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Non-renewable secondary fuels		MJ, net calorific value	0,00E+00	NR	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Net use of fresh water		m³	4,27E-02	NR	1,57E-05	0,00E+00	8,90E-05	0,00E+00

Waste indicators

Parameter	Unit	1 m² U36 [8/4] [A1-A3]	C1	C2	C3	C4	D
Hazardous waste disposed	kg	8,68E-05	NR	5,41E-06	0,00E+00	1,30E-06	0,00E+00
Non-hazardous waste disposed	kg	6,60E-01	NR	4,04E-05	0,00E+00	2,76E+00	0,00E+00
Radioactive waste disposed	kg	3,23E-05	NR	7,03E-08	0,00E+00	4,46E-07	0,00E+00

Output flow indicators

Parameter	Unit	1 m² U36 [8/4] [A1-A3]	C1	C2	C3	C4	D
Components for reuse	kg	0,00E+00	NR	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Material for recycling	kg	1,99E-02	NR	0,00E+00	0,00E+00	1,99E-02	0,00E+00
Materials for energy recovery	kg	5,63E-01	NR	0,00E+00	0,00E+00	5,63E-01	0,00E+00
Exported energy, electricity	MJ	0,00E+00	NR	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy, thermal	MJ	0,00E+00	NR	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Additional environmental information

ACC favors innovation projects that enhance the added value of its products, the safety of people and goods, as well as efficiency in all its aspects.

Within the scope of its sustainability strategy, ACC assumes the following environmental management commitments, as well as compliance with legal compliance obligations or others: “We assess the environmental aspects of our activities, with the aim of protecting the Environment, adopting practices that potentiate the prevention of pollution, as well as the improvement of our environmental performance.”

The sustainability of the business involves the integration in the strategic planning of the different aspects of management, which is why the approach to Quality, Environment, Safety, Energy, Forestry Chain of Custody and System code Management is carried out in an integrated manner in the ACC management system.

ACC has a management system that integrates the different normative references:

- Quality according to the NP EN ISO 9001 standard;
- Environment according to the NP EN ISO 14001 standard;
- Security according to the ISO 450001 standard;
- Energy according to the NP EN ISO 50001 standard
- Forest sustainability (chain of custody) according to Standard FSC-STD-40-004;
- Forest sustainability (chain of custody) According to Norm PEFC ST 2002;
- System code according to CIPR (International Code of Cork Stopper Practices).

The management system, its planning, revision and improvement, is carried out in accordance with the methodology of the PR 101 process - Strategic Management.

- **Estimate environmental impacts**

To estimate the environmental impacts of Underscreed U36 [6/3], the results can be multiplied by the following conversion factors (average): 7,29E-01 for [A1-A3] and 7,81E-01 for [C2, C4].

References

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