

ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804+A2

Owner of the Declaration

Programme holder

Publisher

Declaration number

Issue date

Valid to

Institut Bauen und Umwelt e.V. (IBU)

Institut Bauen und Umwelt e.V. (IBU)

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07.12.2022

06.12.2027

Amorim Wise Cork Pure PU PF
Amorim Cork Flooring S.A.

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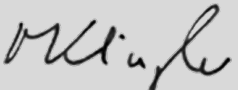


ECO PLATFORM

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1. General Information

Amorim Cork Flooring, S.A. Programme holder IBU – Institut Bauen und Umwelt e.V. Panoramastr. 1 10178 Berlin Germany	Amorim Wise Cork Pure PU PF Owner of the declaration Amorim Cork Flooring, S.A. Rua do Ribeirinho, nº 202 Apartado 13 4536 - 907 S. Paio Oleiros Portugal
Declaration number EPD-ACF-20220041-ICA1-EN	Declared product / declared unit 1 m² of Amorim Wise Cork Pure PU PF
This declaration is based on the product category rules: Floor coverings, 02/2018 (PCR checked and approved by the SVR)	Scope: The data on which the Life Cycle Assessment is based is from the manufacturing process of Amorim Wise Cork Pure PU PF taking place in one industrial unit of Amorim Revestimentos (Oleiros) and is referred to the year of 2020. For the construction, use, end of life stages and benefits and loads, data were estimated based on background research and Amorim Cork Flooring supply chain downstream activities. Data associated with the product's maintenance was obtained through benchmark research.
Issue date 07.12.2022	The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.
Valid to 06.12.2027	The EPD was created according to the specifications of <i>EN 15804+A2</i>. In the following, the standard will be simplified as <i>EN 15804</i>.
 Dipl. Ing. Hans Peters (chairman of Institut Bauen und Umwelt e.V.)	Verification The standard <i>EN 15804</i> serves as the core PCR Independent verification of the declaration and data according to <i>ISO 14025:2010</i> ☐ internally ☒ externally
 Dr. Alexander Röder (Managing Director Institut Bauen und Umwelt e.V.)	 Matthias Klingler (Independent verifier)

2. Product

2.1 Product description/Product definition

Amorim Wise Cork Pure Polyurethane Prefinished (hereby referred to as Cork Pure PU PF) has a natural cork structure, that provides superior comfort and environmental performance for residential areas, with a genuine cork veneer decorative layer and polyurethane finishing. This product is used as a floor covering for domestic use, providing several physical characteristics to the floor, such as stability, comfort, thermal and noise insulation, among others.

For the placing on the market of the product in the European Union/European Free Trade Association (EU/EFTA) (with the exception of Switzerland) Regulation (EU) No. 305/2011 CPR applies. The product needs a Declaration of Performance taking into consideration *EN 14041: 2004/AC:2006 Resilient, textile and laminate floor coverings - Essential characteristics* and the CE-marking. For the application and use the respective national provisions apply.

2.2 Application

Amorim Wise Cork Pure PU PF fits the most demanding needs for domestic areas. This flooring product meets the requirements of the usage class 23 for domestic use according to *ISO 10874* standard.

2.3 Technical Data

Relevant technical construction data for the product is referred in the following table.

Constructional data

Name	Value	Unit
Product thickness	4	mm
Grammage	2100	g/m ²
Product Form	Plank	-
Total thickness	4	mm
Density	525	kg/m ³

Grammage presented in the table above refers to the grammage of the prefinished product at the factory gate (A3). For the usage class requirements to be met, the application of a contact adhesive is necessary at the end of installation (A5). At this point, the finished product grammage corresponds to 2200 g/m².

Amorim Wise Cork Pure PU PF may also be produced and commercialized with different thicknesses, of 6 mm, having the same product composition and production process, but a different weight per square meter of 3.12 kg.

The Performance data of the product is in accordance with the Declaration of Performance with respect to its Essential Characteristics according to *EN 14041:2004/AC:2006 Resilient, textile and laminate floor coverings - Essential characteristics*.

2.4 Delivery status

The dimensions of rectangular panels of Amorim Wise Cork Pure PU PF are declared in the following table.

Dimensions of panels	Specification
Dimensions	600 mm x 300 mm x 4 mm
Variation width (unit - mm)	w _{max} - w _{min} ≤ 0.60 mm
Variation length (maximum, unit - mm)	Δl ≤ 1 mm

The layers composing Amorim Wise Cork Pure PU PF are shown in the following table.

Layer	Thickness	Unit
Wear layer primer	0.02	mm
Decorative cork veneer	0.78	mm
Agglomerated cork layer	3.20	mm

2.5 Base materials/Ancillary materials

Components

The primary product components and materials of the product are indicated as a percentage mass in the following table.

Name	Value	Unit
Cork (broken, shred, veneer)	84.6	%
Additives (Resin)	8.1	%
Additives (Primer PU)	3.9	%
Additives (PVA binder)	3.4	%

The products include partial articles which contain substances listed in the candidate list of *REACH* Regulation 1907/2006/EC (date: 19.01.2021) exceeding 0.1 percentage by mass: no

This product/article/at least one partial article contains other carcinogenic, mutagenic, reprotoxic (CMR) substances in categories 1A or 1B which are not on the candidate list, exceeding 0.1 percentage by mass: no

Biocide products were added to this construction product or it has been treated with biocide products (this then concerns a treated product as defined by the (EU) *Ordinance on Biocide Products No. 528/2012*): no.

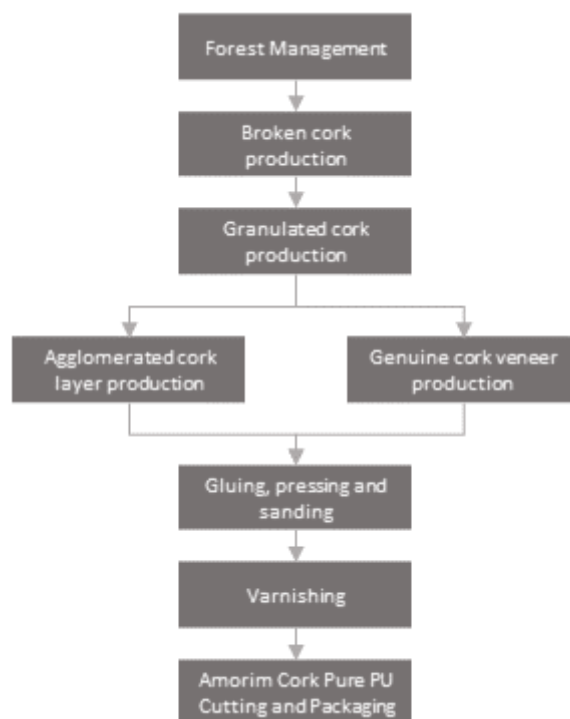
2.6 Manufacture

The manufacturing process of Amorim Wise Cork Pure PU PF begins with cork granulate production, using cork that was previously treated at Amorim Florestal.

Around 88 % of the granulated cork previously produced is forwarded to an agglomeration process in which a melamine-urea-formaldehyde (MUF) resin is used to produce the agglomerated cork layer. This layer is the inferior layer of the final product and constitutes most of the thickness of the product. The remaining granulated cork, together with a polyvinyl acetate (PVA) resin, is used to produce the genuine cork veneer, the decorative layer of the Amorim Wise Cork Pure PU PF.

The agglomerated cork layer and the decorative genuine cork veneer, that compose the final product structure are glued together using glue and adhesives as binding agents. This unfinished product then follows to a pressure and heat process, before going through sanding.

The product is ultimately varnished with a base coat as well as a top coat varnish finishing of Polyurethane and forwarded for the final cut of the pieces. The top coat varnishing finalizes the product in this stage of the Amorim Wise Cork Pure PU PF product, which is then packed and stored in the shipment warehouse, ready for shipment.



2.7 Environment and health during manufacturing

During the production process, the environmental and health aspects are considered.

Air: The emission of particles and pollutants are collected in filter systems and the levels are below the permissible limits.

Water: The product requires a low water consumption that is (totally) treated in an Industrial Waste Water Treatment Plant (IWWTP).

Noise: Noise resulting from operation during the production process is below the permissible limits.

2.8 Product processing/Installation

For heated floors, the temperature of the subfloor must not exceed 28°C (82°F).

In concrete subfloors, the installation should be made not before 21 days after the complete curing of the substrate. The heating phase has to begin with the running temperature of 25°C (78°F) for 3 days. The subfloor should be in place and cured for at least 60-90 days.

During the installation, the temperature of the surface should not exceed 18°C (65°F) and should be kept for 3 days after finishing the installation (for floors). Then the temperature should be increased slowly to a max. of 28°C (82°F) on the subfloor surface.

For the product installation, it is necessary to use an adhesive. Amorim WISE recommends adhesives that are specially developed for ease of use, safety and quality of the application.

2.9 Packaging

Cork Pure coverings are delivered in packages designed to protect the corners, edges and surface of the product, under normal conditions of transport and handling (compliant with *EN 12104*).

Product tiles are wrapped in film and laid in cardboard boxes. Boxes are placed in wooden pallets and wrapped by film.

These packaging materials can be collected separately and recycled.

Pallets can either be re-used (Euro pallets) or recycled as wood.

2.10 Condition of use

Amorim Wise Cork Pure PU PF flooring products have in their composition a significant amount of natural renewable raw materials, meaning that they have stored about 3,4 kg CO₂/m² of product resulting from photosynthesis.

2.11 Environment and health during use

The following table indicates the information about safety properties.

Safety properties - EN 14041 -	Standard Test Method	Unit	Specification
Fire resistance	EN ISO 11925-2 + EN ISO 9239-1 (classification according to EN 13501-1)	Class	Dfl-s1
Slip resistance	EN 13893	Class	DS
Formaldehyde emission	EN 717-1	Class	E1
PCP - Content pentachlorophenol	EN 12673	% mg/kg	Undetectable

2.12 Reference service life

The expected service life of the product was determined based on empirical experience of the

manufacturer, considering the different use classes, according to *ISO 10874*. The following table indicates the expected service life for domestic use.

Application Area	Class	Expected Service Life
Domestic	23	25 years

The installed product must be varnished on-site with a minimum of one coat of a recommended varnish.

2.13 Extraordinary effects

Fire

Fire performance according to *EN 13501 – 1 (building products)* of Amorim Wise Cork Pure PU PF is Dfl-S1.

Water

There are no environmental impacts on water identified in the use stage of the product since the product is mainly composed of natural materials that are not hazardous to water masses.

Mechanical destruction

There is no potential harm to health and environment known resulting from the mechanical destruction of the product.

2.14 Re-use phase

The product is mainly composed of cork. Waste from the product can be reused in the process as a replacement for some of the raw materials. This type of flooring can also be reused, although its service life is expected to be longer than the original warranty from the manufacturer. Regarding energy recovery, cork can be incinerated in order to produce thermal energy or electricity.

2.15 Disposal

According to the *European Waste Catalogue Directive* the used floor covering can be classified in the main category “17 Construction and Demolition Waste (including road construction)”. Considering the specific constitution of this floor covering, and assuming that the layers cannot be separated at the end of life, the waste code applied is the following: 17 09 04 Mixed construction and demolition waste other than those mentioned in 17 09 01, 17 09 02 and 17 09 03.

These types of waste materials can be recovered according to the *European Waste Framework Directive*.

2.16 Further information

Other information can be found on the Amorim Wise website or the website of the manufacturer Amorim Cork Flooring
www.amorimwise.com
www.amorimcorkflooring.com

3. LCA: Calculation rules

3.1 Declared Unit

The declared unit is 1 m² of installed floor covering with the following characteristics:

Declared unit

Name	Value	Unit
Declared unit	1	m ²
conversion factor [Mass/Declared Unit]	0.48	-
Grammage	2.1	kg/m ²
Layer thickness	0.004	m

3.2 System boundary

Type of EPD: cradle to gate with options

Modules A1-A3 Production: Include processes that provide materials, transport of the material to the manufacturing site, energy supply, product manufacturing and transport processes up to the factory gate, as well as waste processing. Biogenic carbon contained in the product and the packaging materials is included in this module.

Module A4 Transport: Transport of the floor covering from the factory gate to the place of installation.

Module A5 Installation: Includes material losses (offcuts) during the installation of the floor covering, use of adhesives and disposal of offcuts and recycling of packaging material.

Module B2 Maintenance: includes provision of energy, for vacuum cleaning once a week, cleaning agent and water consumption, for wet cleaning twice a year.
The LCA results in this EPD are declared for a one-year usage.

Module C1 De-construction: The floor covering is deconstructed manually and no additional environmental impact is caused.

Module C2 Transport: Includes transportation of the postconsumer waste to the waste incineration plant or to a landfill

Module C3 Waste processing and Module C4

Disposal, end-of-life scenarios are declared for:

- 40 % incineration in a waste incineration plant (WIP) and 60 % landfilling (Mixed scenario)
- 100 % incineration in a waste incineration plant (WIP) (Scenario 1)
- 100 % landfilling (Scenario 2)

Module D Benefits and Loads: Declares potential benefits from all net flows given in module A5 (packaging material recycling) and C3 (for incineration, and related energy substitution) that leave the product boundary system after having passed the end-of-waste state.

Module D is declared for each scenario separately.

3.3 Estimates and assumptions

CO₂ intake due to photosynthesis associated to cork was considered. Information on components and average weight percentage of adhesives was obtained from their technical data sheets.

3.4 Cut-off criteria

All input and output flows have been considered at 100 %, including all available data associated directly to the manufacture of the product included in the LCA (i.e. all raw materials, electric and thermal power consumed, transports). Hence, the study complies with the cut-off criteria of 1 % of renewable and non-renewable primary energy usage and 1 % of the total mass of that unit process.

3.5 Background data

For processes in which the producer has no influence or specific information, like the extraction of raw materials, end-of-life treatment and generic data from the following main sources were considered:

- *Ecoinvent 3.5*
- *PRé Consultants*

3.6 Data quality

Specific data is referred to the production of 2020. Data sets of processes from *Ecoinvent* database are less than 4 years old. Data sets are based on literature and average data from specific industrial units. Regarding geographical coverage, average European data and Portugal specific energy mix were used. In cases where no average European data was available, the most approximate data set was used. Considering these aspects, the data used in this study is considered of high quality.

3.7 Period under review

The specific data collected from the manufacturer refer to the year 2020.

3.8 Allocation

Energy, raw materials, water, by-products, waste, wastewater and air emissions were allocated to this product using mass allocation (i.e. allocation based on the proportional mass of each of the products) when no further subdivision of unit processes was deemed feasible.

3.9 Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to *EN 15804* and the building context, respectively the product-specific characteristics of performance, are taken into account.

Background data are taken from the *SimaPro software (version 9.1)* and from the *Ecoinvent 3.5* database, 2018.

4. LCA: Scenarios and additional technical information

Characteristic product properties

Information on biogenic Carbon

The product is composed of 85 % of materials that contain biogenic carbon. Packaging material, which represents 18 % of the packed finished product, that

also contains biogenic carbon is accounted for in this section.

Information on describing the biogenic Carbon Content at factory gate

Name	Value	Unit
Biogenic carbon content in product	0.919	kg C
Biogenic carbon content in accompanying packaging	0.182	kg C

Note: 1 kg biogenic Carbon is equivalent to 44/12 kg of CO₂.

The following information refers to the declared modules and is the basis for calculations or can be used for further calculations. The indicated values refer to the declared unit.

Transport to the construction site (A4)

Name	Value	Unit
Transport, freight, lorry 16-32 metric ton, euro4	230	km
Transport, freight, sea, transoceanic ship	2000	km
Transport, freight, lorry 3,5-7.5 metric ton, euro4	5	km

Installation in the building (A5)

Name	Value	Unit
Auxiliary Contact adhesive	0.2	kg
Material loss	0.063	kg
Output substances following waste treatment on site Packaging waste	0.46	kg

Packaging waste is considered to be recycled and installation waste are considered to be disposed in a landfill.

Maintenance (B2)

Name	Value	Unit
Maintenance cycle (wet cleaning)	2	1/year
Maintenance cycle (vacuum cleaning)	52	1/year
Electricity consumption	0.1	kWh
Water consumption	0.001	m ³
Auxiliary (cleaning agent)	0.02	kg

Reference service life

Name	Value	Unit
Reference service life (according to ISO 15686-1, -2, -7 and -8)	25	a

End of Life (C1-C4)

Name	Value	Unit
Energy recovery 100 % (C3/1)	2.1	kg
Landfilling 100 % (C4/2)	2.1	kg
Transportation from the construction site (C2 and C2/1) (for the incineration EoL - by lorry 16-32 metric tons, euro 4)	50	km
Transportation from the construction site (C2 and C2/2) (for the Landfilling EoL - by lorry 16-32 metric tons, euro 4)	50	km
Energy recovery (C3) (mixed scenarios)	0.84	kg
Landfilling (C4) (mixed scenarios)	1.26	kg

For module C1, is considered that the floorcovering is de-constructed manually with no additional environmental impacts.

Reuse, recovery and/or recycling potentials (D), relevant scenario information

For module D, which represents the benefits and loads beyond the system boundary, the potential benefits from module A5 and C3 are declared, considering the recycling of packaging material waste and energy benefits (incineration EoL).

For the waste incineration combustion scenario in a WIP (R1 > 0.6), energy recuperation is considered.

Name	Value	Unit
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5. LCA: Results

The results for module B2 refer to a period of one year. For the calculation of the impact of B2 for a certain service life the values for B2 have to be multiplied by the estimated service life in years.

For modules C2, C3 and C4 the results are presented considering:

- C2, C3, C4, D refer to 40 % incineration, 60 % landfilling (mixed scenario)
- C2/1, C3/1, D/1 refer to 100 % incineration (scenario 1)
- C2/2, C4/2 and D/2 to 100 % landfilling (scenario 2)

Information on un-declared modules:

Modules B3 - B7 are not declared, since the use stage is declared for 1 year.

Disclaimer: EP-freshwater: This indicator has been calculated as "kg P eq" as required in the characterization model (EUTREND model, Struijs et al., 2009b, as implemented in ReCiPe; <http://eplca.jrc.ec.europa.eu/LCDN/developerEF.xhtml>).

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; ND = MODULE OR INDICATOR NOT DECLARED; MNR = MODULE NOT RELEVANT)

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	ND	X	MNR	MNR	MNR	ND	ND	X	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 m2 Amorim Wise Cork Pure PU PF

Core Indicator	Unit	A1-A3	A4	A5	B2	C1	C2	C2/1	C2/2	C3	C3/1	C4	C4/2	D	D/1	D/2
GWP-total	[kg CO ₂ -Eq.]	2.66E+0	1.61E-1	9.37E-1	1.13E-1	0.00E+0	1.74E-2	1.74E-2	1.74E-2	1.36E+0	3.41E+0	2.17E+0	3.61E+0	-8.58E-1	-2.42E+0	1.84E-1
GWP-fossil	[kg CO ₂ -Eq.]	1.37E+0	1.61E-1	2.70E-1	1.10E-1	0.00E+0	1.74E-2	1.74E-2	1.74E-2	1.56E-2	3.90E-2	1.69E-2	2.82E-2	1.49E+0	3.01E+0	-4.79E-1
GWP-biogenic	[kg CO ₂ -Eq.]	4.03E+0	7.32E-5	6.67E-1	-4.43E-3	0.00E+0	4.15E-6	4.15E-6	4.15E-6	1.35E+0	3.37E+0	2.15E+0	3.59E+0	6.38E-1	5.97E-1	6.66E-1
GWP-luluc	[kg CO ₂ -Eq.]	8.80E-3	6.61E-5	3.78E-4	8.00E-3	0.00E+0	5.53E-6	5.53E-6	5.53E-6	2.57E-6	6.42E-6	7.80E-6	1.30E-5	-5.45E-3	-9.31E-3	-2.89E-3
ODP	[kg CFC11-Eq.]	1.55E-7	3.49E-8	3.19E-8	6.13E-9	0.00E+0	4.01E-9	4.01E-9	4.01E-9	1.30E-9	3.25E-9	5.52E-9	9.20E-9	-1.35E-7	-2.67E-7	-4.67E-8
AP	[mol H ⁺ -Eq.]	9.01E-3	1.76E-3	3.37E-3	5.61E-4	0.00E+0	8.78E-5	8.78E-5	8.78E-5	1.68E-4	4.20E-4	1.45E-4	2.42E-4	-9.55E-3	-1.91E-2	-3.17E-3
EP-freshwater	[kg PO ₄ -Eq.]	4.01E-4	1.62E-5	1.18E-4	6.29E-5	0.00E+0	1.38E-6	1.38E-6	1.38E-6	6.95E-6	1.74E-5	4.04E-6	6.74E-6	-1.27E-3	-2.87E-3	-2.03E-4
EP-marine	[kg N-Eq.]	1.83E-3	3.47E-4	3.05E-4	1.43E-4	0.00E+0	2.97E-5	2.97E-5	2.97E-5	8.74E-5	2.18E-4	5.78E-4	9.63E-4	-1.78E-3	-3.34E-3	-7.37E-4
EP-terrestrial	[mol N-Eq.]	2.18E-2	3.85E-3	3.07E-3	1.11E-3	0.00E+0	3.25E-4	3.25E-4	3.25E-4	8.41E-4	2.10E-3	5.19E-4	8.65E-4	-1.89E-2	-3.53E-2	-7.97E-3
POCP	[kg NMVOC-Eq.]	6.25E-3	1.09E-3	1.08E-3	3.83E-4	0.00E+0	9.23E-5	9.23E-5	9.23E-5	2.06E-4	5.15E-4	1.86E-4	3.11E-4	-4.74E-3	-8.38E-3	-2.31E-3
ADPE	[kg Sb-Eq.]	3.81E-6	3.19E-7	1.42E-6	2.70E-7	0.00E+0	4.85E-8	4.85E-8	4.85E-8	2.32E-8	5.79E-8	2.31E-8	3.84E-8	-1.77E-6	-2.61E-6	-1.22E-6
ADPF	[MJ]	2.30E+1	2.39E+0	4.68E+0	2.36E+0	0.00E+0	2.66E-1	2.66E-1	2.66E-1	1.36E-1	3.40E-1	4.17E-1	6.95E-1	2.93E+1	6.13E+1	7.92E+0
WDP	[m ³ world-Eq deprived]	1.56E+0	1.63E-2	2.80E-1	8.48E-2	0.00E+0	1.83E-3	1.83E-3	1.83E-3	-9.36E-3	-2.34E-2	1.79E-2	2.98E-2	-9.72E-1	1.42E+0	-6.71E-1

Caption: GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources; WDP = Water (user) deprivation potential

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 m2 Amorim Wise Cork Pure PU PF

Indicator	Unit	A1-A3	A4	A5	B2	C1	C2	C2/1	C2/2	C3	C3/1	C4	C4/2	D	D/1	D/2
PERE	[MJ]	1.60E+0	3.69E-2	4.69E-2	1.49E-1	0.00E+0	2.91E-3	2.91E-3	2.91E-3	1.72E+1	4.30E+1	6.96E-3	1.16E-2	-1.23E+1	-8.61E+0	-1.48E+1
PERM	[MJ]	4.30E+1	0.00E+0	-3.63E-1	7.16E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	-1.70E+1	-4.26E+1	0.00E+0	0.00E+0	-5.93E+0	-1.48E+1	0.00E+0
PERT	[MJ]	4.46E+1	3.69E-2	-3.16E-1	2.21E+0	0.00E+0	2.91E-3	2.91E-3	2.91E-3	2.00E-1	4.00E-1	6.96E-3	1.16E-2	-1.83E+1	-2.34E+1	-1.48E+1
PENRE	[MJ]	4.76E+0	2.39E+0	2.04E-1	9.25E-1	0.00E+0	2.66E-1	2.66E-1	2.66E-1	7.42E+0	1.85E+1	4.17E-1	6.95E-1	-2.61E+1	-5.34E+1	-7.93E+0
PENRM	[MJ]	1.82E+1	0.00E+0	-4.48E+0	1.45E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	-5.48E+0	-1.37E+1	0.00E+0	0.00E+0	-3.17E+0	-7.93E+0	0.00E+0
PENRT	[MJ]	2.30E+1	2.39E+0	-4.28E+0	2.37E+0	0.00E+0	2.66E-1	2.66E-1	2.66E-1	1.94E+0	4.80E+0	4.17E-1	6.95E-1	-2.93E+1	-6.13E+1	-7.93E+0
SM	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	4.57E-1	4.57E-1	4.57E-1
RSF	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
NRSF	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
FW	[m³]	1.34E-1	2.33E-3	2.82E-2	1.19E-2	1.98E-4	1.98E-4	1.98E-4	1.98E-4	6.43E-4	1.61E-3	7.72E-4	1.29E-3	-2.33E-1	-4.89E-1	-6.32E-2
Caption	PERE = Use of renewable primary energy excluding renewable primary energy resources 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 resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water															

RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2:

1 m2 Amorim Wise Cork Pure PU PF

Indicator	Unit	A1-A3	A4	A5	B2	C1	C2	C2/1	C2/2	C3	C3/1	C4	C4/2	D	D/1	D/2
HWD	[kg]	1.92E-5	1.42E-6	4.26E-6	8.61E-8	0.00E+0	1.55E-7	1.55E-7	1.55E-7	2.99E-7	7.47E-7	3.25E-7	5.41E-7	-3.45E-5	-7.08E-5	-1.02E-5
NHWD	[kg]	2.75E-1	7.46E-2	6.49E-1	4.45E-4	0.00E+0	1.26E-2	1.26E-2	1.26E-2	1.80E-2	4.50E-2	1.54E+0	2.56E+0	-1.53E-1	-2.71E-1	-7.41E-2
RWD	[kg]	6.78E-5	1.60E-5	1.61E-5	4.05E-7	0.00E+0	1.80E-6	1.80E-6	1.80E-6	3.22E-7	8.06E-7	2.52E-6	4.20E-6	-1.83E-4	-4.19E-4	-2.64E-5
CRU	[kg]	3.23E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
MFR	[kg]	1.28E-1	0.00E+0	4.61E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
MER	[kg]	4.44E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	8.40E-1	2.10E+0	0.00E+0
EEE	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	8.44E+0	2.11E+1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EET	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Caption	HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy															

RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional:

1 m2 Amorim Wise Cork Pure PU PF

Indicator	Unit	A1-A3	A4	A5	B2	C1	C2	C2/1	C2/2	C3	C3/1	C4	C4/2	D	D/1	D/2
PM	[Disease Incidence]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
IRP	[kBq U235-Eq.]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ETP-fw	[CTUe]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
HTP-c	[CTUh]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
HTP-nc	[CTUh]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SQP	[-]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Caption	PM = Potential incidence of disease due to PM emissions; IR = Potential Human exposure efficiency relative to U235; ETP-fw = Potential comparative Toxic Unit for ecosystems; HTP-c = Potential comparative Toxic Unit for humans (cancerogenic); HTP-nc = Potential comparative Toxic Unit for humans (not cancerogenic); SQP = Potential soil quality index															

Disclaimer 1 – for the indicator IRP

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 or radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, radon and from some construction materials is also not measured by this indicator.

Disclaimer 2 – for the indicators ADPE, ADPF, WDP, ETP-fw, HTP-c, HTP-nc, SQP

The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high as there is limited experience with the indicator.

6. LCA: Interpretation

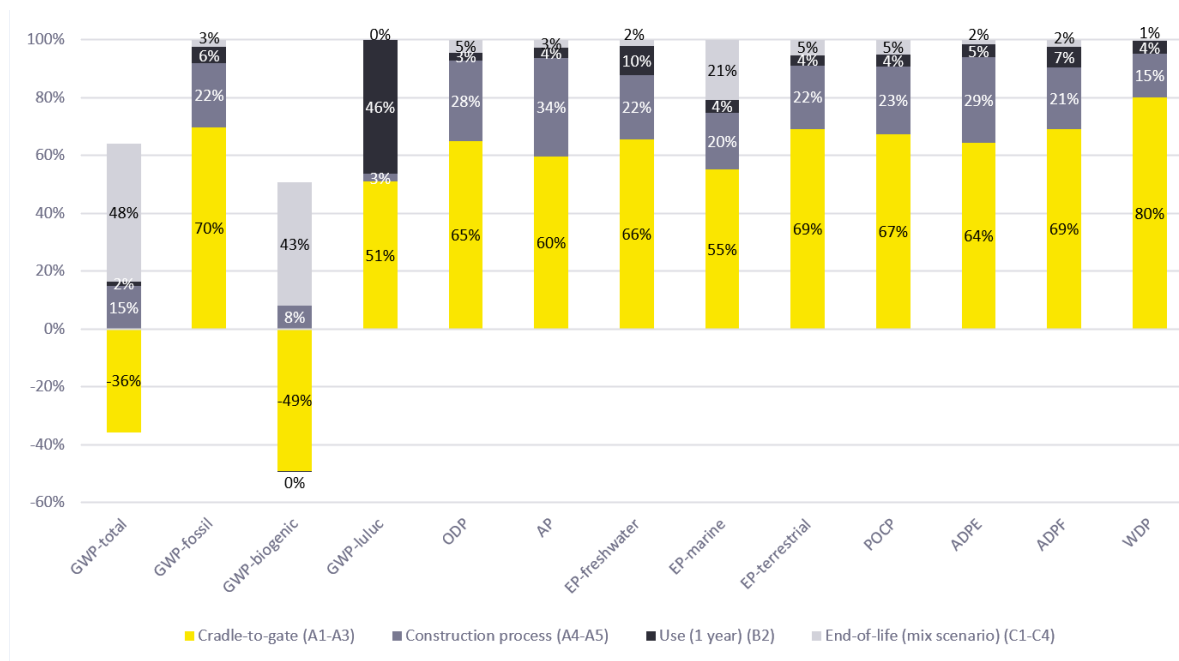
This chapter contains an interpretation of the Life Cycle Impact Assessment categories. When expressed as a percentage, the impact refers to its magnitude expressed as a percentage of the total product impact across all modules, with the exception of module D.

The product stage (A1-A3) of Amorim Wise Cork Pure PU PF has the highest impacts for all impact categories assessed, while the use stage (B2), considering a lifetime of 1 year, has low impacts for most of the impact categories, when compared with other stages.

The high impacts of the product stage of Amorim Wise Cork Pure PU PF, show the relevance of the manufacturing processes, which are mostly related to the use of chemical products and electricity consumption, whose production and use generate emissions of diverse pollutants to the atmosphere and discharges of sludge waste and wastewater. Cork Pure PU PF end-of-life (mix scenario) (C1-C4) also carries relevant potential impacts overall. The end-of-life stage presents the highest contribution for the Global Warming Potential (GWP) – total category, representing 48 % of the result, followed by a

contribution of 43 % in the Global Warming Potential (GWP) – biogenic category, and 21 % of

Eutrophication potential (EP) - marine impact category.



7. Requisite evidence

INDOOR AIR QUALITY

Compliance with the strictest indoor air quality standards after being tested on over 2000 potential chemicals.

French regulation on VOC emissions

French certification, which classifies products according to their level of VOC emissions. Our products have been classified at the highest level (A+).

GREENGUARD Certification

Greenguard North-American certification identifies products that have low chemical emissions, improving the air in which they are used. Our products are awarded the GOLD certification. A stricter certification criteria which ensures that a product is acceptable for use in environments such as schools and healthcare facilities.

Criteria	CAS Number	Maximum Allowable Predicted Concentration	Units
TVOC (A)	-	0.22	mg/m ³
Formaldehyde	50-00-0	9 (7.3 ppb)	µg/m ³
Total Aldehydes (B)	-	0.043	ppm
4-Phenylcyclohexene	4994-16-5	6.5	µg/m ³
Particle Matter less than 10 µm (C)	-	20	µg/m ³
1-Methyl-2-pyrrolidinone (D)	872-50-4	160	µg/m ³
Individual VOCs (E)	-	1/2 CREL or 1/100th TLV	-

TÜV PROFICERT

TÜV-Proficert is a transnational certificate for VOC-emission and air quality, certifying that a product complies with different national regulations such as AgBB (Germany), Belgian VOC regulation, Finnish M1, breem, leed v4 (outside North America), ral -uz 120 and Austrian Eco Label (Guideline uz 56). In October 2018 Amorim Cork Flooring was the first flooring company to achieve TÜV certification at its highest level - Premium.

Name of the testing institute	Entwicklungs- und Prüflabor Holztechnologie GmbH
Number of test report	2117110/2019/3
Testing methods	The test piece was placed into a test chamber - lying on the bottom - under the following conditions, according to ISO 16000-9 Analysis of results according to ISO 16000-3 and ISO 16000-6
Certification program	TÜV PROFICERT

Results

Concentration limits after 3, 7 and 28 days of exposure are presented in the following tables:

Quality Standard

TÜV PROFICERT-product Interior Standard						Compliance of requirements
Parameter	Requirements [µg/m³]		Results [µg/m³]			
	3 days	28 days	3 days	7 days	28 days	
Total volatile organic compounds TVOC (AgBB)	< 10,000	≤ 1,000	216	170	93	yes
Total of semi-volatile organic compounds TSVOC		≤ 100	< 5	< 5	< 5	yes
Total VOC without LCI (D)		≤ 100	22	12	< 5	yes
R-Value (LCI (D)) *		≤ 1	1.127	0.686	0.857	yes
Formaldehyde		< 60	< 6	< 6	< 6	yes
Acetaldehyde		≤ 200	4	4	2	yes
Toluene		≤ 300	n.d.	n.d.	n.d.	yes
Tetrachloroethylene		< 350	n.d.	n.d.	n.d.	yes
Xylene		< 300	1	1	< 1	yes
1,4-Dichlorobenzene		< 90	n.d.	n.d.	n.d.	yes
Styrene		< 350	n.d.	n.d.	n.d.	yes
Trichloroethylene		≤ 1	n.d.	n.d.	n.d.	yes
DEHP		≤ 1	n.d.	n.d.	n.d.	yes
DBP		≤ 1	n.d.	n.d.	n.d.	yes
Carcinogenic, mutagenic substances and substances toxic to reproduction¹	Σ ≤ 10	≤ 1 each	n.d.	n.d.	n.d.	yes
Ammonia²		≤ 149	-	-	-	-
Nitrosamines²		≤ 0.2	-	-	-	-

* dimensionless parameter (for every single value K_i/NIK_i ≤ 1.0)

¹ according EU-category 1A and 1B according to CLP Regulation (EC) No 1272/2008

² test only if parameter is relevance to product

n.d. – not detected

Quality PREMIUM

TÜV PROFICERT-product Interior PREMIUM						Compliance of Requirements
Parameter	Requirements [µg/m³]		Results [µg/m³]			
	3 days	28 days	3 days	7 days	28 days	
Total volatile organic compounds TVOC (AgBB)	< 1,000	≤ 160	216	170	93	yes
Total of semi-volatile organic compounds TVOC		≤ 100	< 5	< 5	< 5	yes
Total VOC without LCI (D)		≤ 100	22	12	< 5	yes
R-Value (LCI (D)) *		≤ 1.0	1.127	0.686	0.857	yes
Formaldehyde		< 10	< 6	< 6	< 6	yes
1,4-Dichlorobenzene		< 60	n.d.	n.d.	n.d.	yes
Trichloroethylene		≤ 1	n.d.	n.d.	n.d.	yes
DEHP		≤ 1	n.d.	n.d.	n.d.	yes
DBP		≤ 1	n.d.	n.d.	n.d.	yes
Carcinogenic, mutagenic substances and substances toxic to reproduction¹	Σ ≤ 10	≤ 1 each	n.d.	n.d.	n.d.	yes
Ammonia²		≤ 24	-	-	-	-
Nitrosamines²		≤ 0.2	-	-	-	-

* dimensionless parameter

¹ according EU-category 1A and 1B according to CLP Regulation (EC) No 1272/2008

² test only if parameter is relevance to product

n.d. – not detected

8. References

AgBB

Umweltbundesamt Germany, Health-related Evaluation of Emissions of Volatile Organic Compounds (VVOC, VOC and SVOC) from Building Products

Austrian Ecolabel

Austrian Ecolabel, Guideline uz 56, Österreichisches Umweltzeichen, Stubenbastei 5, A-1010 Wien, Austria

BREEAM

Building Research Establishment Environmental Assessment Method, Building Research Establishment UK (BRE)

BS EN 12667

BS EN 12667:2001 - Thermal performance of building materials and products. Determination of thermal resistance by means of guarded hot plate and heat flow meter methods. Products of high and medium thermal resistance

DIN EN 717-1

DIN EN 717-1:2005 - Wood-based panels - Determination of formaldehyde release - Part 1: Formaldehyde emission by the chamber method

EN 12104

EN 12104:2018 - Resilient floor coverings - Cork floor tiles – Specification

EN 13329

EN 13329:2000 - Laminate floor coverings. Specifications, requirements and test methods

EN 13501-1

EN13501-1:2007:Fire classification of construction products and building elements-Part1: Classification using data from reaction to fire tests

EN 13893

EN 13893:2002 - Resilient, laminate and textile floor coverings. Measurement of dynamic coefficient of friction on dry floor surfaces

EN 14041

EN 14041:2004 - Resilient, textile and laminate floor coverings – Essential characteristics

EN 14085

EN 14085:2010 - Resilient floor coverings - Specification for floor panels for loose laying

EN 15804

EN 15804:2012-04+A2 2019: Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products

EU/BPR

Regulation (EU) 528/2012 (BPR), European Union/Biocidal Products Regulation (EU/BPR)

EU/EFTA

Regulation (EU) No. 305/2011 (CPR), European Union/European Free Trade Association (EU/EFTA)

Eurofins Product Testing A/S

RAL-UZ 120 - Eurofins Miljø, Smedeskøvej 38, 8464 Galten, Denmark

European List of Waste

European List of Waste (ELW) (Commission Decision 2000/532/EC)

European Waste Catalogue Directive

European Waste Catalogue (EWC) (Commission Decision 94/3/EC)

European Waste Framework Directive

Waste Framework Directive (WFD) (2008/98/EC)

GREENGUARD

Greenguard North-American certification

Institut Bauen und Umwelt

Institut Bauen und Umwelt e.V.: General Instructions for the EPD programme of Institut Bauen und Umwelt e.V., Version 2.0, Berlin: Institut Bauen und Umwelt e.V., 2021. www.ibu-epd.com

ISO 105-B02

ISO 105-B02:2013 - Textiles -- Tests for colour fastness -- Part B02: Colour fastness to artificial light: Xenon arc fading lamp test

ISO 10874

ISO 10874:2009 - Resilient, textile and laminate floor coverings -- Classification

ISO 14025

DIN EN ISO 14025:2011-10: Environmental labels and declarations — Type III environmental declarations — Principles and procedures

ISO 16000-6

ISO 16000-6:2011 - Indoor air - Part 6: Determination of volatile organic compounds in indoor and test chamber air by active sampling on Tenax TA sorbent, thermal desorption and gas chromatography using MS or MS-FID

ISO 16000-9

ISO 16000-9:2006 - Indoor air - Part 9: Determination of the emission of volatile organic compounds from building products and furnishing -- Emission test chamber method

ISO 16581

ISO 16581:2014 - Resilient and laminate floor coverings -- Determination of the effect of simulated movement of a furniture leg

ISO 23997

ISO 23997:2007- Resilient floor coverings -- Determination of mass per unit area

ISO 24336

ISO 24336:2005 - Laminate floor coverings - Determination of thickness swelling after partial immersion in water

ISO 24342

ISO 24342:2007 - Resilient and textile floor-coverings -
- Determination of side length, edge straightness and squareness of tiles

ISO 24343 – 1

ISO 24343-1:2007 - Resilient and laminate floor coverings -- Determination of indentation and residual indentation -- Part 1: Residual indentation

ISO 4918

ISO 4918:2009 - Resilient, textile and laminate floor coverings -- Castor chair test

LEED

LEED v4: Reference Guide for Building Design and Construction - Outside North America

PCR Part A+A2, version 1.1.1

Institut Bauen und Umwelt e.V., Berlin (pub.): Product Category Rules for Construction Products from the range of Environmental Product Declarations of Institut Bauen und Umwelt (IBU), Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Project Report according to EN 15804+A2:2019. April 2021 (www.bau-umwelt.de)

PCR Part B

Product Category Rules for Construction Products from the range of Environmental Product Declarations of Institut Bauen und Umwelt (IBU), Part B: Requirements on the EPD for floor coverings, V1.2, Berlin: Institut Bauen und Umwelt e.V. (IBU), February 2018

REACH

Regulation (EC) No 1907/2006, Regulation concerning the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH)

SimaPro

SimaPro software-system version 9.1 (PRé consultants) and Ecoinvent 3.5 database, 2018

UL 2818 - 2013

UL 2818 - 2013 Standard for Chemical Emissions for Building Materials, Finishes and Furnishings

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