

# ENVIRONMENTAL PRODUCT DECLARATION

as per /ISO 14025/ and /EN 15804/

Owner of the Declaration	Amorim Revestimentos S.A.
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-AMO-20210074-IAB1-EN
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Issue date	24/08/2021
Valid to	23/08/2026

Cork Flooring Floating with high resistance varnish (WRT)  
and with UV varnish (WPS)

Amorim Revestimentos S.A.

[www.ibu-epd.com](http://www.ibu-epd.com) / <https://epd-online.com>



## 1. General Information

Amorim Revestimentos S. A.

### Programme holder

IBU - Institut Bauen und Umwelt e.V.  
Panoramastr. 1  
10178 Berlin  
Germany

### Declaration number

EPD-AMO-20210074-IAB1-EN

### This declaration is based on the product category rules:

Floor coverings, 02/2018  
(PCR checked and approved by the SVR)

### Issue date

24/08/2021

### Valid to

23/08/2026



Dipl. Ing. Hans Peters  
(President of Institut Bauen und Umwelt e.V.)



Dr. Alexander Röder  
(Head of Board IBU)

Cork Flooring Floating with high resistance varnish (WRT) and with UV varnish (WPS)

### Owner of the declaration

Amorim Revestimentos, S.A.  
Rua do Ribeirinho, nº 202  
Apartado 13  
4536 - 907 S. Paio Oleiros  
Portugal

### Declared product / declared unit

1 m2 of Cork Flooring Floating with high resistance varnish (WRT) and with UV varnish (WPS)

### Scope:

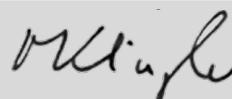
The data on which the Life Cycle Assessment is based on the production process of Cork Flooring Floating with high resistance varnish (WRT) and with UV varnish (WPS). The components of the product are produced in various plants: the broken cork is produced in Florestal, the agglomerate cork layer in Oleiros and the backing layer in Lourosa. The data used is from both industrial units and refers to the year of 2017 and the first half of 2018.

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.

### Verification

The standard /EN 15804/ serves as the core PCR  
Independent verification of the declaration and data  
according to /ISO 14025:2010/

internally  externally



Matthias Klingler  
(Independent verifier appointed by SVR)

## 2. Product

### 2.1 Product description / Product definition

Cork Flooring Floating with high resistance varnish (WRT) and with UV varnish (WPS) are the right choice to fit the most demanding needs of domestic areas and commercial areas with moderate traffic, ensuring exceptional strength and longevity with a pleasant touch accomplished with the varnish. The three cork layers ensure all the comfort and wellbeing benefits provided by cork.

This product consists of a backing cork layer, followed by a high-density fireboard (HDF), an agglomerated cork layer, and a decorative cork veneer, covered with UV resistant varnishes.



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

Cork Flooring Floating with high resistance varnish (WRT) and with UV varnish (WPS) has a high-performance surface layer and has been specially developed for areas with heavy traffic, such as commercial, business or general public areas. This flooring product meets the requirements of the usage classes 31 for commercial use and 23 for domestic use according to *ISO 10874*. Class 31 products are suitable for commercial areas with heavy traffic.

## 2.3 Technical Data

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

Name	Value	Unit
Product thickness <i>ISO 24346</i>	10.5 +0.25	mm
Grammage <i>ISO 23997</i>	Nominal value (8000) - 10%; +13%	gm <sup>2</sup>
Product Form	1220x140x10.50mm	-
Layer thickness (Top layer)	0.5	mm
Squareness <i>ISO 24342</i>	≤ 0.50	mm
Straightness <i>ISO 24337</i>	≤ 0.30	mmm
Openings <i>ISO 24337</i>	≤ 0.20	mm
Height difference <i>ISO 24337</i>	≤ 0.15	mm
Flatness of the panel (Length - Concave Convex) <i>ISO 24337</i>	≤ 0.50 ≤ 1.00	%
Flatness of the panel (Width - Concave Convex) <i>ISO 24337</i>	≤ 0.10 ≤ 0.15	%
Dimensional stability (humidity) <i>EN 669, Annex C</i>	≤ 5	%
Castor chair <i>EN 425</i>	No disturbance to the surface other than slight change	Visual effect after 25000 cycles
Simulated movement of a furniture leg <i>EN 424</i>	No damage shall be visible after testing with a type 2	Visual effect
Residual indentation <i>ISO 24343-1</i>	≤ 0,40	mm

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 Cork Flooring Floating with high resistance varnish (WRT) and with UV varnish (WPS) are declared in the following table.

Dimensions of panels (ISO 24337)	Component
<b>Dimensions</b>	1220 x 140 x 10,50 mm ± 0,10% with:
<b>Variation width</b>	max. 0,5 mm
<b>Variation length</b>	max. 2,0 mm

The layers composing Cork Flooring Floating with high resistance varnish (WRT) and with UV varnish (WPS) are shown in the following table.

Products	Component	Thickness (mm)
Cork Flooring Floating with high resistance varnish (WRT) or UV varnish (WPS)	Protective Surface	-
	Cork Veneer (cork decorative)	0,5
	Cork layer (IN 3.9)	2,8
	HDF	6,0
	Cork Underlay (BL 1.2)	1,2

## 2.5 Base materials / Ancillary materials

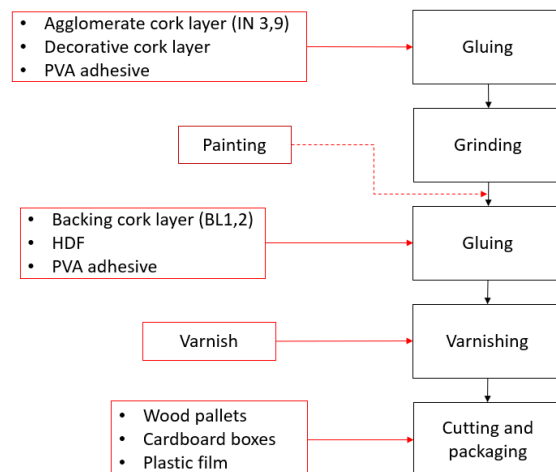
The primary product components and materials of the product are indicated as a percentage mass in the following table.

Component	Percentage (in weight) (%)
Cork Underlay	3,02
HDF	61,52
Cork layer	30,13
Cork decorative layer	1,31
Adhesive	2,68
Paint	0,22
Varnish	1,12

- 1) This product contains substances listed in the *candidate list* (date: 26.01.2020) exceeding 0.1 percentage by mass: no.
- 2) This product 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.
- 3) 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

General flow production of Cork Flooring Floating with high resistance varnish (WRT) and with UV varnish (WPS) is represented in the following graphic.



The manufacturing process of the flooring product begins by assembling the agglomerate cork layer and the decorative layer using a cold-melt adhesive. Then the decorative cork layer is painted and these components are blended with the layers of HDF and BL 1,2, using the cold-melt adhesive. The final layer is the varnish and the resulting board is then cut into the defined dimensions and is now ready for packaging and storage.

## 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, so no special measures are required.

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

**Noise:** Noise resulting from operation during the production process is below the permissible limits, and no beyond national guidelines, measures are required.

## 2.8 Product processing/Installation

In order to install the product, a mohair roller, pressure roller, tape measure, craft knife, pencil, straight edge, chalk line, cloth and a rubber hammer are needed. More information on installing the flooring product can be found on the manufacturer's website.

## 2.9 Packaging

Resilient floor coverings are delivered in packages designed to protect the corners, edges and surfaces of the product, under normal conditions of transport and handling (compliant with *EN 13329*).

Product planks are laid in cardboard boxes, wrapped in packaging film and placed on wooden pallets, secured by plastic straps.

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

The substantial composition during the use phase refers to the composition during the manufacturing. The conditions of use are described in the producer's documentation.

## 2.11 Environment and health during use

**Environmental protection:** According to current information, water, air and soil are not exposed to any dangers when the products Cork Flooring Floating with high resistance varnish (WRT) and with UV varnish (WPS) are used as designated.

**Health protection:** According to current information, no damage to or impairment of health can be anticipated when Cork Flooring Floating with high resistance varnish (WRT) and with UV varnish (WPS) are used as designated.

## 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 and commercial uses.

Application area	Class	Expected service life
Domestic	23	25 years
Commercial	31	15 years

Influences on ageing when applied in accordance with the rules of technology.

## 2.13 Extraordinary effects

### Fire

Fire performance according to *EN 13501-1* (building products) of Cork Flooring Floating with high resistance varnish (WRT) and with UV varnish (WPS) is Cfl-s1.

### Fire protection

Name	Value
Building material class	Cfl-s1
Smoke gas development	s1
Burning droplets	NA

### Water

There are no ingredients that could be washed out and have environmental impacts on water 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 mechanical destruction of the product.

## 2.14 Re-use phase

The product is mainly composed of cork and high-density fiberboard (HDF). The boards can be shredded, granulated or powdered and then re-melted to make a secondary input material. Waste from this flooring product can be reused in the process as a replacement (of) for some of the raw materials. This type of flooring product can also be reused, although its service life is expected to be less than the original warranty from the manufacturer. Regarding energy recovery, cork and wood 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.

## 2.16 Further information

Further information can be found on the website of the different brands of the manufacturer Amorim Revestimentos:  
<http://www.wicanders.com/>

### 3. LCA: Calculation rules

#### 3.1 Declared Unit

The declared unit is 1 m<sup>2</sup> of floor covering with the following characteristics:

##### Declared unit

Name	Value	Unit
Declared unit	1	m <sup>2</sup>
Conversion factor to 1 kg (kg/m <sup>2</sup> )	8	-
Grammage	8	kg/m <sup>2</sup>

The EPD is representative of just one product, which can have different types of decorative layers.

#### 3.2 System boundary

Type of the EPD: cradle to gate. This EPD includes the stage A1-A3 - Production Stage: Includes the production phase of all the products and chemicals used in the product, the transport of these materials from the suppliers to the industrial unit and the production stage of Cork Flooring Floating with high resistance varnish (WRT) and with UV varnish (WPS).

#### 3.3 Estimates and assumptions

Information on components and average weight percentage of adhesives was obtained from their technical data sheets.

Existing inventory data were not available for the particular Resin polyurethane (PU), PU adhesive and polyvinyl alcohol (PVA) adhesive used in the product so these were modelled based on alternative materials as a proxy.

Thermal energy was also adapted to consider the emission of other pollutants, as particles, nitrogen oxides (NO<sub>x</sub>) and volatile organic compound (VOC)'s. For the UV varnish, since the quantities differ in the WRT and WPS pavement, it was considered the average value.

The impact of using the HDF is withdrawn from the EPD of the product (reference EPD – SON- 20160210 - IBA1 - EN).

#### 3.4 Cut-off criteria

All available data directly associated with the manufacture of the product was included in the LCA, with the exception of infrastructure and buildings. 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 which the producer has no influence or specific information on, like the extraction of raw materials, generic data from the following main sources were considered:

- *Ecoinvent 3.4*
- *PRé Consultants*

#### 3.6 Data quality

Specific data refers to the production of 2017 and first half of 2018. Data sets of processes from *Ecoinvent* database are less than 2 years old. Data sets are

based on literature and average data from specific industrial units. Regarding geographical coverage, whenever possible average European data and a Portugal specific energy mix was 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 of high quality.

#### 3.7 Period under review

The specific data collected from the manufacturer refer to the year 2017 and the first half of 2018.

#### 3.8 Allocation

Energy, water, wastewater and air emissions allocated to this product were determined by the manufacturer, considering the different processes involved in the production of the product.

##### Water

Water use, per m<sup>2</sup> of product, was determined based on water consumption data on each product stage/equipment, considering the total yearly consumption of water in each stage and the total quantity of products (in m<sup>2</sup>) that undergo each stage. This calculation is based on the assumption that each m<sup>2</sup> of semi-product that undergoes each specific stage requires the same amount of water, regardless of mass or specific weight.

##### Inputs of energy

Energy inputs were calculated based on an annual consumption of electricity and thermal energy associated with the equipment, the same way as it was made for water use. Considering the annual production (in m<sup>2</sup>) of every semi-product, it was estimated an average consumption of energy per m<sup>2</sup> of semi-product.

##### Emissions to air

Emissions of pollutants to air are associated with the consumption of thermal energy in the production of Cork Flooring Floating with high resistance varnish (WRT) and with UV varnish (WPS). Both Oleiros and Lourosa are equipped with industrial boilers fueled by cork powder. The powder used comes from different process stages, namely gridding, agglomeration, etc. The amount of pollutants per kcal of thermal energy consumption was calculated by dividing the total year emissions resulting from the combustion process in each boiler by the thermal energy consumption.

##### Emission of water vapour

The amount of water vapour evaporated in the dryer during the production process of Cork Flooring Floating with high resistance varnish (WRT) and with UV varnish (WPS) is calculated assuming that the raw cork required to produce the cork layers has a medium humidity of about 13% and needs to be absolutely dry, with 0% humidity. This means that the total amount of water evaporated in the dryer is equivalent to 13% of the weight in cork.

##### Emissions of formaldehyde

The melamine-urea-formaldehyde resin used in the production process of Cork Flooring Floating with high resistance varnish (WRT) and with UV varnish (WPS) contains formaldehyde which is partially released in the dryer. The amount of formaldehyde released was calculated based on a percentage of the amount of this component in the resin.

##### Waste

The amount of each type of waste material per kg of product is the ratio between the total yearly production of waste (kg) in each stage and the total quantity of products (in m<sup>2</sup>) that undergo these stages.

#### **Wastewater**

Wastewater produced in each process was determined the same way as it was done in water consumption.

### **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.

The data sets used are from *Ecoinvent 3.4*.

## **4. LCA: Scenarios and additional technical information**

The end-of-life of the packaging material is not declared. The following values show the applied materials and amounts per 1m<sup>2</sup> flooring product:

- Paper: 1,09E-02 kg/m<sup>2</sup>
- PE-film: 2,53E-02 kg/m<sup>2</sup>
- Wooden pallet: 1,21E-02 kg/m<sup>2</sup>

The CO<sub>2</sub> uptake in respect to the wooden pallet is included in the information on CO<sub>2</sub>-uptake of the total product, but not in the GWP-value of the result table.

## 5. LCA: Results

### DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE NOT DECLARED)

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	MND	MND	MND	MND	MNR	MNR	MNR	MND	MND	MND	MND	MND	MND	MND

### RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: 1 m<sup>2</sup> Cork Flooring Floating with high resistance varnish (WRT) and with UV varnish (WPS)

Parameter	Unit	A1-A3
Global warming potential	[kg CO <sub>2</sub> -Eq.]	5.43E+0
Depletion potential of the stratospheric ozone layer	[kg CFC11-Eq.]	1.04E-6
Acidification potential of land and water	[kg SO <sub>2</sub> -Eq.]	5.51E-2
Eutrophication potential	[kg (PO <sub>4</sub> ) <sup>3</sup> -Eq.]	8.60E-1
Formation potential of tropospheric ozone photochemical oxidants	[kg ethene-Eq.]	7.52E-1
Abiotic depletion potential for non-fossil resources	[kg Sb-Eq.]	2.50E-5
Abiotic depletion potential for fossil resources	[MJ]	1.88E+2

### RESULTS OF THE LCA - RESOURCE USE: 1 m<sup>2</sup> Cork Flooring Floating with high resistance varnish (WRT) and with UV varnish (WPS)

Parameter	Unit	A1-A3
Renewable primary energy as energy carrier	[MJ]	5.28E+1
Renewable primary energy resources as material utilization	[MJ]	1.47E+2
Total use of renewable primary energy resources	[MJ]	2.00E+2
Non-renewable primary energy as energy carrier	[MJ]	1.47E+2
Non-renewable primary energy as material utilization	[MJ]	3.91E+1
Total use of non-renewable primary energy resources	[MJ]	1.86E+2
Use of secondary material	[kg]	1.95E-1
Use of renewable secondary fuels	[MJ]	9.48E+0
Use of non-renewable secondary fuels	[MJ]	0.00E+0
Use of net fresh water	[m <sup>3</sup> ]	1.03E-1

### RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES:

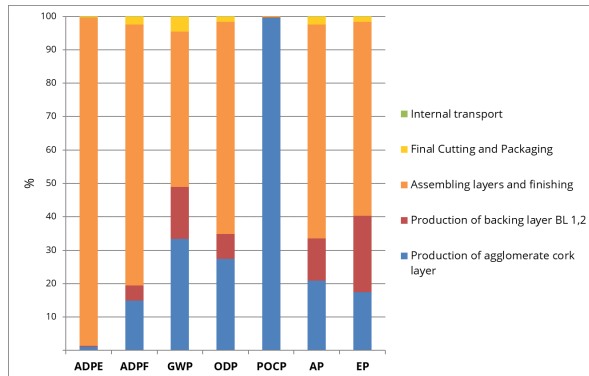
#### 1 m<sup>2</sup> Cork Flooring Floating with high resistance varnish (WRT) and with UV varnish (WPS)

Parameter	Unit	A1-A3
Hazardous waste disposed	[kg]	1.01E+0
Non-hazardous waste disposed	[kg]	7.15E-1
Radioactive waste disposed	[kg]	2.23E+0
Components for re-use	[kg]	0.00E+0
Materials for recycling	[kg]	9.50E-2
Materials for energy recovery	[kg]	0.00E+0
Exported electrical energy	[MJ]	1.98E-3
Exported thermal energy	[MJ]	2.27E-2

The CO<sub>2</sub> content of Cork Flooring Floating With High Resistance Varnish is 1,30E+00 kg per 1 m<sup>2</sup> of product. The declared GWP-value shows the result of GWP without sequestered CO<sub>2</sub>.

The declared values for SM, RSF, EEE and EET refer solely to the applied product MDF, integrated into the final product.

## 6. LCA: Interpretation



According to the graph above, the processes of the products **Cork Flooring Floating with high resistance varnish (WRT) and with UV varnish (WPS)** with the highest impacts are the production of the agglomerate cork layer and assembling and finishing.

### Abiotic Depletion (ADP)

As for ADP, the component with the highest impact is the HDF. According to the EPD of this material, the impacts are “caused almost completely by infrastructure processes, such as the buildings required for the production of urea-formaldehyde/melamine urea-formaldehyde (UF/MUF) resins (about 80 %); the main resources contributing to the ADP (elements) are gold and copper; The impacts regarding the HDF are associated to the urea-formaldehyde resin in the dataset, necessary to agglomerate the wood fibres.”

### Abiotic Depletion (fossil fuels)

The main contribution to ADP fossil fuels is also HDF (associated with the assembling stage). Regarding the HDF, the EPD indicates that the impacts are “caused mainly by the consumption of natural gas and crude oil for the production of the UF/MUF resins and to a much smaller extent for the generation of electricity.

### Global Warming Potential (GWP)

This category is affected negatively mainly by the production of the agglomerate cork layer, assembling and packaging. This is associated to electricity usage and the impacts are linked to the emission of global warming gases into the atmosphere while burning fossil fuels.

The positive impact in this category is due to the CO<sub>2</sub> stored in the products, due to cork and wood.

### Ozone layer Depletion (ODP)

Ozone layer depletion is influenced mainly by the same components as the ADP fossil fuels category. Impacts of assembling the layers are related to HDF, due to “around 60 % of the ODP are associated with the use of natural gas in upstream processes for the production of UF/MUF resins”, with the release of pollutants during transport of natural gas. These pollutants are mainly halons and Chloro-fluoro-carbons (CFCs) that are released in the combustion of the fuels.

### Photochemical Oxidation (POCP)

The component/process with more significant impacts in this category is the agglomerate cork layer. The impacts of the agglomerate cork layer are linked to the emissions of nitrogen oxides, particulates and formaldehyde associated with the MUF resins.

### Acidification Potential (AP)

The component/process with more impact on the acidification potential is HDF. The impacts of HDF are caused by the use of urea in the process and by the upstream processes for the production of UF/MUF resins used in the production of the uncoated medium density fibreboard (MDF) (electricity generation, transport of raw materials, onsite combustion processes for the production of heat).

### Eutrophication Potential (EP)

EP impacts are due to the direct emissions of pollutants during the combustion of cork powder in the boiler and also the HDF. Regarding the HDF, the impacts are caused by the use of melamine and urea and associated with the production process (the same responsible for AP impacts). The impacts of thermal energy are linked to the combustion of wood ashes

## 7. Requisite evidence

### GREENGUARD Certification

The product has also been certified according to the GREENGUARD Certification Program.

<b>Certification Program:</b>	GREENGUARD Certification
<b>Number of test report:</b>	68197-410
<b>Reference Standard:</b>	UL 2818 - 2013 Gold Standard for Chemical Emissions for Building Materials, Finishes and Furnishings

Criteria: GREENGUARD Certification emissions limits were first used as purchasing specifications for the US

EPA and the State of Washington for furniture and commercial building products. GREENGUARD Certification criteria have been the basis for the LEED credit for low emitting furniture since 2002. Office Furniture products that are GREENGUARD Certified are also compliant with the BIFMA X7.1 standard and BIFMA e3 credit 7.6.2.

### Results

GREENGUARD Certification affirms that representative samples of the products tested meet the criteria of the reference standard and the requirements of the specific certification program.

Criteria	CAS Number	Maximum Allowable Predicted Concentration	Units
TVOC	-	0.50	mg/m <sup>3</sup>
Formaldehyde	50-00-0	61.3 (50 ppb)	µg/m <sup>3</sup>
Total Aldehydes	-	0.10	ppm
Particle Matter less than 10 µm	-	50	µg/m <sup>3</sup>
4-Phenylcyclohexene	4994-16-5	6.5	µg/m <sup>3</sup>
Individual VOCs	-	1/10th TLV	-



## GREENGUARD Gold

In addition to meeting the *GREENGUARD* Certification criteria, the product also complies with the requirements of *GREENGUARD* Gold.

<b>Certification Program:</b>	GREENGUARD Gold Certification Criteria for Building Products and Interior Finishes
<b>Number of test report:</b>	68197-420
<b>Reference Standard:</b>	UL 2818 - 2013 Gold Standard for Chemical Emissions for Building Materials, Finishes and Furnishings

Criteria: This standard includes health-based criteria for additional chemicals and also requires lower total VOC emissions levels to ensure that products are acceptable for use in environments such as schools and healthcare facilities. In addition to limiting

emissions of more than 360 VOCs and total chemical emissions, *GREENGUARD* Gold Certified products must also comply with the requirements of the State of California's Department of Public Health "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers, Version 1.2 (2017)".

### Results

*GREENGUARD* Certification affirms that representative samples of the products tested meet the criteria of the referenced standard and the requirements of the specific certification program.

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

## 8. References

### /IBU 2016/

IBU (2016): General Programme Instructions for the Preparation of EPDs at the Institut Bauen und Umwelt e.V., Version 1.1 Institut Bauen und Umwelt e.V., Berlin.  
[www.ibu-epd.de](http://www.ibu-epd.de)

### /ISO 14025/

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

### /EN 15804/

/EN 15804:2012-04+A1 2013/, Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products

### ANSI/BIFMA X7.1

ANSI/BIFMA X7.1 - 2011(R2016) FES Standard

### ANSI/BIFMA e3

ANSI/BIFMA e3 Furniture Sustainability Standard Tools

### Candidate List of substances of very high concern for Authorisation

Candidate List of substances of very high concern for Authorisation (published in accordance with Article 59(10) of the REACH Regulation)

### California Office of Environmental Health Hazard Assessment

The Office of Environmental Health Hazard Assessment (OEHHA)

### Ecoinvent version 3.4

Ecoinvent version 3.4, Ecoinvent, October 2017

### EN 424

BS EN 424:1993 - Resilient floor coverings. Determination of the effect of the simulated movement of a furniture leg

### EN 425

BS EN 425:2002 - resilient and laminate floor coverings. Castor chair test

### EN 717-1

EN 717-1:2004 - Wood-based Panels – Determination of Formaldehyde Release – Formaldehyde emission by the chamber method

### EN 12667

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Leadership in Energy and Environmental Design

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**PRé Consultants**

PRé Consultants B.V.

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