

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-2015001-IBB1-EN
Issue date	16.01.2015
Valid to	15.01.2020

Artcomfort Floating WRT
Amorim Revestimentos S. A.

www.bau-umwelt.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

Declaration number

EPD-AMO-2015001-IBB1-EN

This Declaration is based on the Product Category Rules:

Floor coverings, 09-07-2012
(PCR tested and approved by the independent expert committee)

Issue date

16.01.2015

Valid to

15.01.2020



Prof. Dr.-Ing. Horst J. Bossenmayer
(President of Institut Bauen und Umwelt e.V.)



Dr.-Ing. Burkhard Lehmann
(Managing Director IBU)

Artcomfort Floating WRT

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 Artcomfort Floating WRT

Scope:

The data on which the Life Cycle Assessment is based is from the production process of Artcomfort Floating WRT taking place in both industrial units of Amorim Revestimentos (Oleiros and Lourosa). The data used is from both industrial units and is referred to the year of 2011. The owner of the declaration shall be liable for the underlying information and evidence.

Verification

The CEN Norm EN 15804 serves as the core PCR

Independent verification of the declaration and data according to ISO 14025

☐ internally ☒ externally

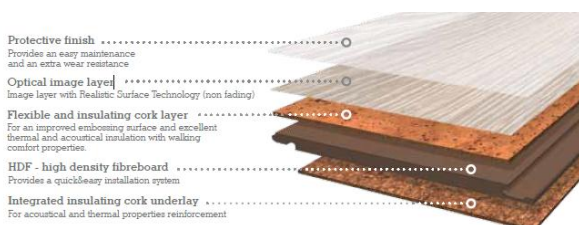


Patricia Wolf
(Independent verifier appointed by SVA)

2. Product

2.1 Product description

Artcomfort Floating WRT (Wear Resistance Technology) is a type of resilient floor covering and has been specially developed to fit the most demanding needs of domestic areas. WRT varnish is based on ceramic compounds which ensure exceptional strength and longevity. Artcomfort Floating WRT tiles consist of a backing cork layer, followed by a high density fibreboard HDF board and a flexible and insulating cork layer. The top decorative cork layer is printed with the optical image required and covered with UV resistant varnishes.



2.2 Application

Artcomfort Floating WRT fit the most demanding needs for domestic areas. This flooring product meets the requirements of the usage classes 31 for commercial use and 23 for domestic use according to /ISO 10874/ standard. Class 31 products are besides residential

use also suitable for commercial areas with low or intermittent use.



2.3 Technical Data

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

General Properties EN 14085 + EN12104	Standard-Test Method	Unit	Specification
Overall thickness	ISO 24346	Average mm Individual values mm	10,5 (Nominal thickness) ± 0,25 Maximum deviation from the average ± 0,30
Squareness Straightness measured at the surface layer	ISO 24342	mm	≤ 0,50 ≤ 0,30
Flatness of the panel: Length: Concave / convex Width: Concave / convex	EN 14085 Annex A	%	≤ 0,50 / ≤ 1,0 ≤ 0,10 / ≤ 0,15
Openings between panels: Average Individual values	EN 14085 Annex B	mm	< 0,15 < 0,20
Height difference	EN 14085	mm	< 0,15

General Properties EN 14085 + EN12104	Standard- Test Method	Unit	Specification
between panels: Average Individual values	Annex B		< 0,20
Dimensional variation caused by changes in atmospheric humidity	EN 14085 Annex C / EN 669	%	< 5
Thickness of top cork surface	ISO 24346	mm	3,1
Mass per unit area	ISO 23997	g/m ²	8800 +/- 10%
Apparent density: Average Individual values	ISO 23996	kg/m ³	≥ 760 ≥ 95% nominal value
Classification properties - EN 14085	Standard- Test Method	Unit	Specification
Castor chair	EN 425	Visual effect after 25000 cycles	No disturbance to the surface other than slight change in appearance and no delaminating shall occur
Simulated movement of a furniture leg	EN 424	Visual effect	No damage shall be visible when tested with foot type 0
Thickness swelling floor panel	ISO 24336	%	≤ 18
Residual indentation	ISO 24343-1	mm	≤ 0,4

2.4 Placing on the market / Application rules

For the placing on the market in the EU/EFTA (with the exception of Switzerland) the Regulation (EU) No. 305/2011 dated from 9 March 2011 applies. The products need a Declaration of Performance taking into consideration /EN 14041:2004 Resilient, textile and laminate floor coverings — Essential characteristics EN 14041:2004/AC:2006/ and the CE-marking.

In addition the following technical standards apply:
EN 12104:2000 - Resilient floor coverings - Cork floor tiles – Specification.

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

For the application and use of the products the respective national provisions apply.

2.5 Delivery status

The dimensions of rectangular panels of Artcomfort Floating WRT are declared in the following table.

Dimensions of panels (ISO 24342)	Specification
Dimensions	1220 x 185 mm (Nominal) ± 0,10% with:
Variation width	max. 0,5 mm
Variation length	max. 2,0 mm

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The constituting layers of Artcomfort Floating WRT are showed in the following table.

Name	Value	Unit
Genuine cork veneer with UV coating varnishes	0,8	mm
Agglomerate cork layer	2,2	mm
HDF – high density fibreboard	6	mm
Backing cork layer	1,5	mm

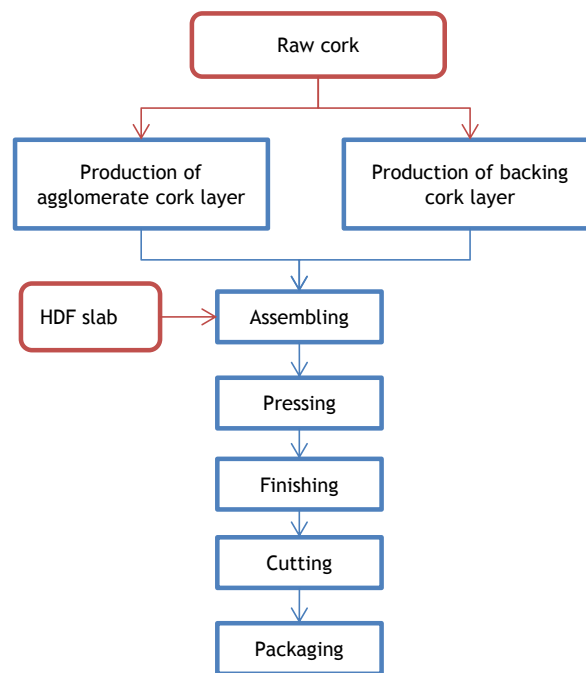
2.6 Base materials / Ancillary materials

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

Components	Percentage (in weight)
HDF	57%
Cork	43%

2.7 Manufacture

General flow production of Artcomfort Floating WRT is represented in the following graphic.



The production process begins with the manufacturing of agglomerate cork and the cork backing layer. Following this process, HDF is assembled to both cork layers. This stage is followed by printing the desired pattern to the top surface. After printing, the product is assembled to a PVC layer. The top layer is coated with a protective varnish, creating a hard wearing surface. The next stage consists in pre-cutting and cutting, in order to shape the planks. The last stage is packaging.

2.8 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.

2.9 Product processing/Installation

The subfloor must be even, flat, dry and variations should not exceed 3 mm in 2 m (0.12" in 6.6 feet).

All type of concrete, wooden and ceramic surfaces must be completely dry.

Never install Wicanders floating floors with Corkloc® without using a PE moisture barrier film with a minimum thickness of 0,2 mm (0.008").

More information on installing the flooring product can be found in manufacturer's website.

2.10 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.

2.11 Condition of use

Artcomfort Floating WRT flooring products are mostly constituted by natural renewable raw materials, meaning that they have stored about 21,35 kg CO₂/m² of product resulting from photosynthesis.

2.12 Environment and health during use

The following table indicates the information about safety properties.

Safety properties - EN 14041	Standard-Test Method	Unit	Specification
Slip Classification	EN 13893	Class	DS
Formaldehyde emission	DIN EN 717-1	Class	E1
Electrical behaviour	EN 1815	KV	Not Antistatic
Content pentachlorophenol (PCP)	CEN/TR 14823 (jhd-W 409)	mg/kg	CP Free inferior to detection limit (0,1 mg/kg)

2.13 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, commercial and industrial uses.

Application area	Class	Expected service life
Domestic	23	15 years
Commercial	31	5 years

2.14 Extraordinary effects

Fire

Fire performance according to EN 13501 – 1 (building products) of Artcomfort Floating WRT 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 by natural materials that are not hazardous to water masses.

Mechanical destruction

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

2.15 Re-use phase

The product is mainly composed by cork and HDF (wood). Wood and cork can also be suitable for composting. Waste from the product can be reused in the process as replacement of some of the raw materials. This type of flooring can also be reused, although its service life is expected to be less than the original warranty from the manufacturer. Regarding energy recovery, wood and cork can be incinerated in order to produce thermal energy or electricity.

2.16 Disposal

According to European Waste Catalogue 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.

3. LCA: Calculation rules

3.1 Declared Unit

The declared unit is 1 m² of floor covering with the following characteristics (average of both industrial units):

Name	Value	Unit
Declared unit	1	m ²
Conversion factor to 1 kg	1,25E-01	-

3.2 System boundary

Type of the EPD: cradle to gate - with options. This EPD includes the following stages:

- Stage A1-A3 - Production Stage: Includes the production phase of all the products and chemicals used in the product, carbon sequestration of the raw material (wood and cork), the transport of these materials from the suppliers to the industrial unit of

Amorim Revestimentos and the production stage of Artcomfort Floating WRT;

- Stage A4 – Transport to the construction site: Includes land and sea transport of the final product of the industrial unit of Amorim Revestimentos, in Portugal, to the distribution center.

- Stage B2 - Maintenance: In this stage it was considered the normal cleaning for flooring, vacuuming and using of a damp mopping.

- Stage D - Benefits and loads beyond the product system boundary of the system: This stage refers to the energy recovery of the product.

3.3 Estimates and assumptions

CO₂ intake due to photosynthesis associated to cork and wood was considered, according to /EN 16449/. Information on components and average weight

percentage of varnishes and adhesives was obtained from their technical data sheets.

3.4 Cut-off criteria

All available data associated directly to the manufacture of the product was included in the LCA. 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

Specific data was used based on average production of 2011. For processes which the producer has no influence or specific information, like the extraction of raw materials, generic data from the following main sources were considered:

- Ecoinvent 2.0
- EPD (Energy services of Portugal)
- IEA (International Energy Agency)
- Laboratorium für Energiesysteme
- EPA (Environmental Protection Agency)
- BUWAI n°232
- Eco-profiles of the European Plastics Industry
- European database for Corrugated Cardboard Life Cycle Studies
- WISARD 2007

3.6 Data quality

Specific data is referred to production of 2011. Data sets of processes from Ecoinvent database is less than 8 years old. Data sets are based on literature and average data from specific industrial units. Regarding geography coverage, whenever possible it was used average European data and Portugal specific energy mix. In cases where no average European data was available, it was used the most approximate data set.

3.7 Period under review

The specific data collected from the manufacturer is referred to the year of 2011.

3.8 Allocation

Cork powder resulting from production is reused in the process to produce thermal energy and electricity. Cork shreds are also reused internally in the process. Internal recycling/reusing of these materials is, therefore, considered a closed loop process.

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.

4. LCA: Scenarios and additional technical information

Transport to the construction site (A4)

Name and additional	Value	Unit
Litres of fuel	30	l/100km
Transport distance (Lorry)	50	km
Transport distance (Freight ship)	2102	km
Capacity utilisation (including empty runs)	100	%
Gross density of products transported	1	kg/m ³
Capacity utilisation volume factor	1	-

Maintenance (B2)

Name and additional	Value	Unit
Maintenance cycle – vacuum cleaning	3,65E+02	Number/15 years
Maintenance cycle - damp mopping	7,80E+02	Number/15 years
Water consumption	9,9E-04	m ³
Auxiliary - detergent	1,00E-5	L
Electricity consumption	1,3E-01	kWh

Repair

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

After the service life of the product, Artcomfort can be sent for incineration, which implies energy recovery. The end of life of the product was constructed using Wisard software, a module developed by Ecobilan – PwC France, considering the typical incineration conditions in Germany. The total product considered was 8 kg/m².

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	Construction-installation process	Use	Maintenance	Repair	Replacement ¹⁾	Refurbishment ¹⁾	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	MND	MND	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: 1 m2 of floor covering Artcomfort Floating WRT (A1-A3, A4, B2, D)

Parameter	Parameter	Unit	A1-A3 Production	A4 Transport	B2 Maintenance	D Reuse-Recovery-Recycling potential
GWP	Global warming potential	[kg CO ₂ -Eq.]	-6,75E+00	1,50E-01	4,00E-02	-2,23E+00
ODP	Depletion potential of the stratospheric ozone layer	[kg CFC11-Eq.]	5,60E-07	1,10E-07	1,80E-10	-4,00E-07
AP	Acidification potential of land and water	[kg SO ₂ -Eq.]	3,10E-04	1,30E-05	4,80E-07	5,70E-05
EP	Eutrophication potential	[kg (PO ₄) ³⁻ -Eq.]	7,20E-03	2,30E-04	8,80E-06	1,70E-03
POCP	Formation potential of tropospheric ozone photochemical oxidants	[kg Ethen Eq.]	2,90E-03	1,60E-04	1,30E-05	-2,10E-03
ADPE	Abiotic depletion potential for non fossil resources	[kg Sb Eq.]	5,90E-02	9,10E-04	3,40E-04	-3,10E-02
ADPF	Abiotic depletion potential for fossil resources	[MJ]	1,24E+02	1,89E+00	7,10E-01	-6,54E+01

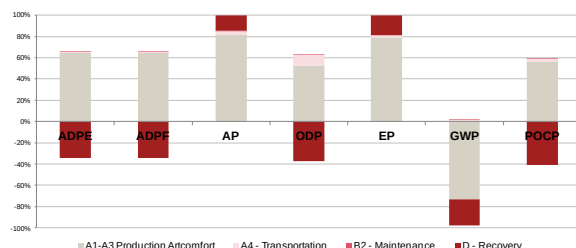
RESULTS OF THE LCA - RESOURCE USE: 1 m2 of floor covering Artcomfort Floating WRT (A1-A3, A4, B2, D)

Parameter	Parameter	Unit	A1-A3 Production	A4 Transport	B2 Maintenance	D Reuse-Recovery-Recycling potential
PERE	Renewable primary energy as energy carrier	[MJ]	7,43E+01	1,00E-02	3,10E-01	3,18E+01
PERM	Renewable primary energy resources as material utilization	[MJ]	3,31E+01	0	0	3,31E+01
PERT	Total use of renewable primary energy resources	[MJ]	1,07E+02	1,00E-02	3,20E-01	6,49E+01
PENRE	Non renewable primary energy as energy carrier	[MJ]	9,42E+01	1,91E+00	7,00E-01	2,51E+01
PENRM	Non renewable primary energy as material utilization	[MJ]	-1,03E+01	0	0	-1,55E+02
PENRT	Total use of non renewable primary energy resources	[MJ]	8,39E+01	1,91E+00	7,00E-01	-1,30E+02
SM	Use of secondary material	[kg]	3,41E-01	0	0	0
RSF	Use of renewable secondary fuels	[MJ]	0	0	0	0
NRSF	Use of non renewable secondary fuels	[MJ]	0	0	0	0
FW	Use of net fresh water	[m ³]	6,15E-02	1,80E-04	1,00E-04	9,60E-04

RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES: 1 m2 of floor covering Artcomfort Floating WRT (A1-A3, A4, B2, D)

Parameter	Parameter	Unit	A1-A3 Production	A4 Transport	B2 Maintenance	D Reuse-Recovery-Recycling potential
HWD	Hazardous waste disposed	[kg]	4,33E-02	4,30E-05	1,36E-06	2,40E-01
NHWD	Non hazardous waste disposed	[kg]	9,25E-01	3,59E-04	4,20E-03	-2,18E-02
RWD	Radioactive waste disposed	[kg]	1,97E-04	3,05E-05	9,88E-07	-1,98E-04
CRU	Components for re-use	[kg]	2,80E+00	0	0	0
MFR	Materials for recycling	[kg]	5,30E-01	1,10E-06	1,50E-05	2,40E-01
MER	Materials for energy recovery	[kg]	0	0	0	0
EEE	Exported electrical energy	[MJ]	0	0	0	0
EET	Exported thermal energy	[MJ]	0	0	0	0

6. LCA: Interpretation



Global warming

The potential impacts obtained on global warming were negative, indicating the carbon sequestration is higher than the greenhouse gas emissions produced during the production process, transport and maintenance. The incorporation of MDF also contributed to lowering the impact as it is a product made mostly of wood, contributing to the carbon sink. The graph of the production stage shows that the production phases that contribute to lowering the impact are the production of the base and the base with decor (A1.a, A1.a1) and the MDF, influenced by the carbon sink.

Stratospheric ozone depletion potential

The analysis of this indicator depicts the decomposition of ozone in equilibrium status due to annual emissions, mainly from CFCs and NOx. The impacts are more significant in the production phase. The graph of the production stage shows that the incorporation of MDF and the production of thermal energy are responsible for this impact. These impacts are associated with the use of varnishes and resins and also associated with the gases emitted while burning the cork.

However, the energy recovery phase compensates the negative impact of the Artcomfort production stage.

Soil and water acidification potential

This indicator shows the contribution of the production process to soil and water acidification through the introduction of acidifying pollutants such as SO₂. Once again, it is the production stage that has a higher percentage of impacts on this indicator. The main cause of these impacts is the consumption of electricity in all of the processes. The contribution is approximately 40% for the heat energy production.

This contribution is associated with the emission of NO_x, which is transformed into an acid (nitric acid) on contact with the atmosphere. The road transport used throughout the entire LCA also contributes to this indicator. There is also heat energy production in the MDF process. This is why these two steps in the process have a higher contribution than the others.

Eutrophication potential

This indicator assesses the quantity of nutrients in the form of phosphate compounds that can contribute to the eutrophication process in water resources. It is the production stage that has the highest impact, approximately 50%. This impact, as happened with the soil and water acidification potential, is mainly caused by the MDF and heat energy production stages.

Tropospheric ozone forming potential

This indicator depicts the atmospheric emissions contributing to photochemical smog. The sequence of reactions involving volatile organic compounds and NO_x leads to the formation of ozone, a highly oxidant compound. It was seen that the MDF production contributes most to this impact, around 50%. This impact is associated with the consumption of electricity and natural gas and the production of thermal energy, also existing in this process.

Non-fossil (ADP – elements) and fossil (ADP - fossil fuels) resources abiotic depletion potential

This indicator depicts the extraction of the minerals and the fossil fuels used in the system. The abiotic depletion factor is determined for each extraction of minerals and of fossil fuels based on their reserves and the rate of deaccumulation. The graph of potential environmental impacts of the production phase shows that the phases which contribute most to this indicator are the production process phases associated with the consumption of raw material and fuels associated with the production.

7. Requisite evidence

7.1 VOC emissions and other indoor air quality parameters

French legislation

Artcomfort Floating WRT was subjected to tests in order to determine the quantities of VOCs, formaldehydes, acetaldehyde and other CMR (Carcinogenic, Mutagenic or Toxic to Reproduction) substances to obtain the classification of the product according to criteria established by the recent French legislation.

Name of the testing Institute:	LQAI - Laboratório da Qualidade do ar interior
Number of test report:	LQAI.MC.46/12
Testing methods:	Tests in a room after 28 days of exposure according to ISO 16000-9 standards Analysis of results according to ISO 16000-6

Results

Concentration limits and correspondent classes according to French legislation after 28 days of exposure to specific surface emission rate of 1,25 m³ h⁻¹ m⁻² are presented in the following table.

Substance	Concentration (µg/m ³)			
	Classes			
	C	B	A	A+
Formaldehyde	>120	<120	<6	<10
Acetaldehyde	>400	<400	<300	<200
Toluene	>600	<600	<450	<300
Tetrachloroethylene	>500	<500	<350	<250
Xylene	>400	<400	<300	<200
1,2,4 - trimethylbenzene	>2000	<2000	<1500	<1000
1,4 - Dichlorobenzene	>120	<120	<90	<60
Ethylbenzene	>1500	<1500	<1000	<750
2 - Butoxyethanol	>2000	<2000	<1500	<1000
Styrene	>500	<500	<350	<250
COVT	>2000	<2000	<1500	<1000

Concentration limits of CMR and correspondent classes according to French legislation after 28 days of exposure to specific surface emission rate of $1,25 \text{ m}^3 \text{ h}^{-1} \text{ m}^{-2}$ are presented in the following table.

Substance	Limits ($\mu\text{g}/\text{m}^3$)
Trichloroethylene	<1
Benzene	<1
Phthalate de bis (2-ethylhexyle)	<1
Phthalate de dibutyle	<1

The material has achieved a Classification of A+ according to French legislation since the results have not exceeded the concentration limits correspondent to that class and are also below the concentration limits of CMR substances.

GREENGUARD Certification Program for Chemical Emissions for Building Materials, Finishes and Furnishings

This product has also been certified according to the GREENGUARD Certification Program for Chemical Emissions for Building Materials, Finishes and Furnishings.

Certification Program:	GREENGUARD Certification Program for Chemical Emissions for Building Materials, Finishes and Furnishings
Number of test report:	24719-410
Reference Standard:	UL 2818 GREENGUARD Certification Program for Chemical Emissions for Building Materials, Finishes and Furnishings

Criteria: Listing of measured carcinogens and reproductive toxins as identified by California Proposition 65, the U.S. National Toxicology Program (NTP), and the International Agency on Research on Cancer (IARC) must be provided.

Substances	Allowable Limits
TVOC	$\leq 0,5 \text{ mg}/\text{m}^3$

Formaldehyde	$\leq 0,05 \text{ ppm}$
Total Aldehydes	$\leq 0,1 \text{ ppm}$
Individual VOCs	$\leq 0,1 \text{ TLV}$
4-phenylcyclohexene	$\leq 0,0065 \text{ mg}/\text{m}^3$

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.

GREENGUARD Children & Schools Certification Criteria

In addition to meeting the GREENGUARD Children & Schools Certification Criteria, this product complies with CA Section 01350 Version 1.1, including the 2012 update for formaldehyde at $9 \mu\text{g}/\text{m}^3$ (office seating $\leq 4.5 \mu\text{g}/\text{m}^3$).

Certification Program:	UL GREENGUARD Gold Certification (formerly known as GREENGUARD Children & Schools Certification)
Number of test report:	24719-420
Reference Standard:	UL 2818 GREENGUARD Gold Certification Program for Chemical Emissions for Building Materials, Finishes and Furnishings

Criteria	Allowable Limits
Individual VOCs	$\leq 1/100 \text{ TLV}$ and $\leq 1/2 \text{ CA CREL}$ (Office Seating $\leq 1/100 \text{ TLV}$ and $\leq 1/4 \text{ CA CREL}$)
Formaldehyde	$\leq 7,8 \text{ ppb}$ (Office Seating $\leq 8,65 \text{ ppb}$)
TVOC	$\leq 0,22 \text{ mg}/\text{m}^3$
Total Aldehydes	$\leq 0,048 \text{ ppm}$ / 48 ppb
Total Phthalates	$\leq 0,01 \text{ mg}/\text{m}^3$
Total Particles	$\leq 0,02 \text{ mg}/\text{m}^3$

Results

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

8. References

Institut Bauen und Umwelt 2011

Institut Bauen und Umwelt e.V., Berlin (pub.):

General principles

for the EPD range of Institut Bauen und Umwelt e.V. (IBU), 2011-09
www.bau-umwelt.de

PCR 2011, Part A

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 Background Report. September 2012 (www.bau-umwelt.de)

PCR 2011, Part B

Institut Bauen und Umwelt e.V., Berlin (pub.): PCR Guidance-Texts for Building-Related Products and Services
From the range of Environmental Product Declarations of Institute Construction and Environment e.V. (IBU)
Part B: Requirements on the EPD for Floor coverings
June 2012
www.bau-umwelt.de

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 23996

ISO 23996:2007- Resilient floor coverings -- Determination of density

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 24346

ISO 24346:2006 - Resilient floor coverings --
Determination of overall thickness

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

BS EN 424

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

BS EN 425

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