

ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804

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|--------------------------|--------------------------------------|
| 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-2013141-E |
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| Valid to | 30.06.2018 |

Corkcomfort Glue-down HPS Amorim Revestimentos S. A.

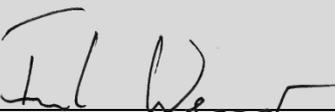
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Institut Bauen
und Umwelt e.V.



1. General Information

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|---|---|
| <p>Name of manufacturer</p> <p>Programme holder IBU - Institut Bauen und Umwelt e.V. Panoramastr. 1 10178 Berlin Germany</p> <hr/> <p>Declaration number EPD-AMO-2013141-E</p> <hr/> <p>This Declaration is based on the Product Category Rules: Floor coverings, 09-07-2012 (PCR tested and approved by the independent expert committee, SVA)</p> <hr/> <p>Issue date 01.07.2013</p> <hr/> <p>Valid to 30.06.2018</p> <hr/> <p> Prof. Dr.-Ing. Horst J. Bossenmayer (President of Institut Bauen und Umwelt e.V.)</p> <hr/> <p> Prof. Dr.-Ing. Hans-Wolf Reinhardt (Chairman of SVA)</p> | <p>Name of construction product</p> <p>Owner of the Declaration Amorim Revestimentos, S.A. Rua do Ribeirinho, nº 202 Apartado 13 4536 - 907 S. Paio Oleiros Portugal</p> <hr/> <p>Declared product / Declared unit 1 m² of Corkcomfort Glue-down HPS</p> <hr/> <p>Scope: The data on which the Life Cycle Assessment is based is from the production process of Corkcomfort Glue-down HPS 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.</p> <hr/> <p>Verification</p> <p>The CEN Norm EN 15804 serves as the core PCR</p> <p>Independent verification of the declaration and data according to ISO 14025</p> <p><input type="checkbox"/> internally <input checked="" type="checkbox"/> externally</p> <hr/> <p> Dr. Frank Werner (Independent tester appointed by SVA)</p> |
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2. Product

2.1 Product description

Corkcomfort Glue-down HPS (High Performance Surface) is a type of resilient floor covering with a multilayer structure. The traditional glue down solution provides superior comfort and minimal step sound. HPS surface finish (High Performance Surface) has been specially developed for areas with heavy traffic, such as commercial, business or general public areas. Corkcomfort Glue-down HPS consist in a PVC backing layer, an agglomerated pressed cork with a natural decorative cork and a PVC top layer covered with UV resistant varnishes.



2.2 Application

Corkcomfort Glue-down HPS 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 33 and 42 for commercial use and 23 for domestic use according to ISO 10874 standard. Class 33 products are suitable for commercial areas with heavy traffic while class 42 is suit to industrial areas in general.



2.3 Technical Data

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

| General properties - EN 655 | Standard - Test Method | Unit | Specification |
|--|---------------------------|-------------------|---------------------------------------|
| Overall thickness | ISO 24346 | mm | ± 0,20 |
| Squareness and Straightness: ≤ 400mm > 400mm | ISO 24342 | mm | ≤ 0,25 ≤ 0,35 |
| Wear layer density | ISO 23996 | kg/m ² | Nominal value (1360) ± 50 |
| Thickness of agglomerated composition cork base | EN 660-1 | mm | 2,5 |
| Thickness of polyvinylchloride backing (average) | EN 660-1 | % | (0,25mm) ± 10% |
| Dimensional stability after exposure to heat | EN 14085 Annex C / EN 669 | % | ≤ 0,4 |
| Curling after exposure to heat | EN 14085 Annex C / EN 669 | mm | ≤ 6 |
| Peel resistance | ISO 24345 | N/50mm | ≥ 35 |
| Mass per unit area | ISO 23997 | g/m ² | Nominal value (2700) +13%; -10% |

| General properties - EN 655 | Standard - Test Method | Unit | Specification |
|--|------------------------|-------------------------------------|--|
| Wearing Group | EN 660-1 | Thickness loss (Δl mm) | Wear group T |
| Thickness of wear layer (Wear Group T) | EN 660-1 | mm (Nominal value) | $\geq 0,5$ |
| Overall thickness | ISO 24346 | mm | $\geq 3,0$ |
| Classification properties - EN655 | Standard - Test Method | Unit | Specification |
| Castor chair | EN 425 | Visual effect - after 25 000 cycles | No disturbance to the surface other than slight change in appearance and no delamination shall occur |
| Simulated movement of a furniture leg | EN 424 | Visual effect | No damage shall be visible after testing with a type 2 foot |
| Residual indentation | ISO 24343-1 | mm | $\leq 0,20$ |

2.4 Placing on the market / Application rules

The standards and general technical approval regarding Corkcomfort Glue-down HPS are the following:

EN 655:2001 - Resilient floor coverings. Tiles of agglomerated composition cork with polyvinyl chloride wear layer - Specification.

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

2.5 Delivery status

The dimensions of rectangular panels of Corkcomfort Glue-down HPS are declared in the following table.

| Dimensions of panels (ISO 24342) | Specification | Unit |
|----------------------------------|-----------------------------|------|
| Width | $\pm 0,10$ with max. 0,5 mm | % |
| Length | max. 2,0 | mm |

The constituting layers of Corkcomfort Glue-down HPS are showed in the following table.

| Name | Value | Unit |
|--|-------|------|
| Hard wearing surface with a protective varnish | 0,5 | mm |
| Genuine cork vanner | 0,8 | mm |
| Agglomerate cork layer | 1,65 | mm |
| Vinyl backing layer | 0,25 | mm |

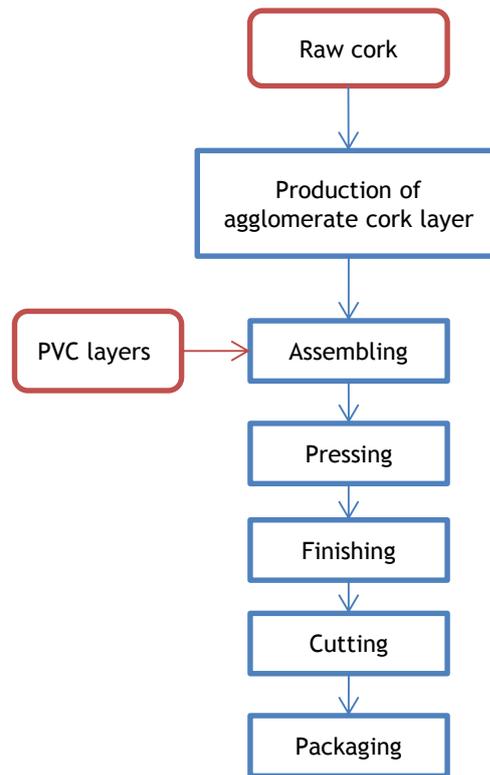
2.6 Base materials / Ancillary materials

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

| Components | Percentage (in weight) |
|------------|------------------------|
| Cork | 56,0% |
| Adhesives | 10,9% |
| Varnishes | 0,6% |
| PVC | 32,5% |

2.7 Manufacture

General flow production of Corkcomfort Glue-down HPS is represented in the following graphic.



The process beginning with the manufacturing of agglomerate pressed cork. Following this process, cork layer and both PVC layers are assembled and then the product undergoes through a pressing process. 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 packing.

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 IWWTP.

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

2.9 Product processing/Installation

In order to install the product, it is necessary a mohair roller, pressure roller, tape measure, craft knife, pencil, straight edge, chalk line, cloth and a rubber hammer. 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.

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

Corkcomfort Glue-down HPS flooring products are mostly constituted by natural renewable raw materials, meaning that they have stored about 3,59 kg of biogenic CO₂ 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 (ihd-W 409) | mg/Kg | PCP Free Inferior or equal to 0,5 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 RSL for domestic, commercial and industrial uses.

| Application area | Class | Expected service life |
|------------------|-------|-----------------------|
| Domestic | 23 | 25 years |
| Commercial | 33 | 15 years |

2.14 Extraordinary effects

Fire

Fire performance according to EN 13501 – 1 (building products) of Corkcomfort Glue-down HPS is Bfl 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 PVC. PVC layers can be shredded, granulated or powdered and then re-melted to make a secondary input material. Cork can also be suitable for composting. Waste from this flooring product can be reused in the process as replacement of 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 PVC can be incinerated in order to produce thermal energy or electricity. However, incineration of PVC originates emissions of chlorine in waste streams, contaminated ash residue and eventual emission of dioxins.

2.16 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 codes 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:

| Name | Value | Unit |
|---------------------------|----------|----------------|
| Declared unit | 1 | m ² |
| Conversion factor to 1 kg | 3,70E-01 | - |

3.2 System boundary

Type of the EPD: cradle to gate
This product stage includes the provision of all materials, products and energy, as well as waste processing up to the end-of-waste state or disposal of final residues. The system boundary includes also those processes that provide the material and energy inputs into the system and the following manufacturing and transport processes up to the factory gate, as well as the processing of any waste arising from those processes.

3.3 Estimates and assumptions

CO₂ intake due to photosynthesis associated to cork and wood was considered. Information on

components and average weight percentage of varnishes and adhesives was obtained from suppliers.

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 and electricity production, generic data from Ecoinvent database, considering geographical significance, have been used.

3.6 Data quality

Specific data is referred to production of 2011. Data sets of processes from Ecoinvent database were updated in 2010 and created mostly in 2003. 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, regarding geography and technology coverage.

3.7 Period under review

The period from each the specific data from the manufacturer was obtained is referred to the year 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. Although there is a surplus of cork waste produced in the process that is not used internally, it is still consumed in production of other products within the factory, for it is not considered a co-product and its impacts are assumed to be insignificant. As there is no clear

information about the type of recycling process, the external recycling of waste from process is considered environmentally irrelevant, falling in the cut-off criteria of 1% of total mass of the unit process. However, transport to the site where recycling takes place is considered in this analysis.

Regarding inputs and outputs of water, energy, waste, wastewater and air emissions, it was considered both the total year consumption/production of each specific input or output and the total quantity of products (in m²) that undergo each stage to calculate a percentage of inputs and outputs associated to the product under study. The diesel consumption due to internal transportation associated to the product is an average based on a percentage of the overall production.

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: 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 BOUNDARYS |
|---------------------|-----------|---------------|----------------------------|-----------------------------------|-----------|-------------|--------|---------------------------|-----------------------------|------------------------|-----------------------|----------------------------|-----------|------------------|----------|--|
| 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 | MND | MND | MND | MND | MND | MND | MND | MND | MND | MND | MND | MND | MND | MND |

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT:

1 m² of floor covering Corkcomfort Glue-down HPS (A1-A3)

| Parameter | Parameter | Unit | 1 m ² of floor covering Corkcomfort Glue-down HPS (A1-A3) |
|-----------|--|--|--|
| GWP | Global warming potential | [kg CO ₂ -Eq.] | 5,00E+00 |
| ODP | Depletion potential of the stratospheric ozone layer | [kg CFC11-Eq.] | 4,84E-07 |
| AP | Acidification potential of land and water | [kg SO ₂ -Eq.] | 6,60E-02 |
| EP | Eutrophication potential | [kg (PO ₄) ³⁻ -Eq.] | 7,26E-03 |
| POCP | Formation potential of tropospheric ozone photochemical oxidants | [kg Ethen Eq.] | 2,82E-03 |
| ADPE | Abiotic depletion potential for non fossil resources | [kg Sb Eq.] | 2,40E-05 |
| ADPF | Abiotic depletion potential for fossil resources | [MJ] | 1,59E+02 |

RESULTS OF THE LCA - RESOURCE USE:

1 m² of floor covering Corkcomfort Glue-down HPS (A1-A3)

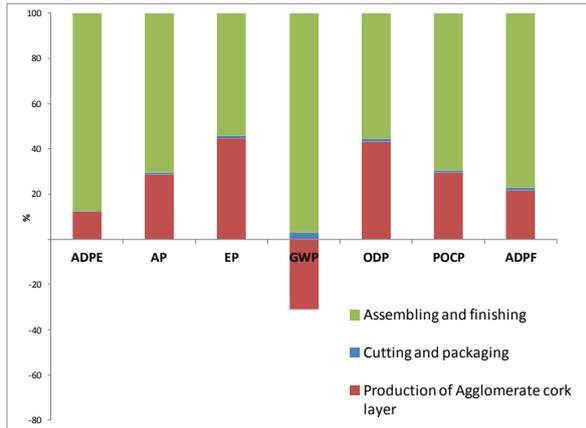
| Parameter | Parameter | Unit | 1 m ² of floor covering Corkcomfort Glue-down HPS (A1-A3) |
|-----------|--|-------------------|--|
| PERE | Renewable primary energy as energy carrier | [MJ] | 2,40E+01 |
| PERM | Renewable primary energy resources as material utilization | [MJ] | 3,29E+01 |
| PERT | Total use of renewable primary energy resources | [MJ] | 5,69E+01 |
| PENRE | Non renewable primary energy as energy carrier | [MJ] | 1,25E+02 |
| PENRM | Non renewable primary energy as material utilization | [MJ] | 2,94E+01 |
| PENRT | Total use of non renewable primary energy resources | [MJ] | 1,55E+02 |
| SM | Use of secondary material | [kg] | 0 |
| RSF | Use of renewable secondary fuels | [MJ] | 0 |
| NRSF | Use of non renewable secondary fuels | [MJ] | 0 |
| FW | Use of net fresh water | [m ³] | 3,84E-01 |

RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES:

1 m² of floor covering Corkcomfort Glue-down HPS (A1-A3)

| Parameter | Parameter | Unit | 1 m ² of floor covering Corkcomfort Glue-down HPS (A1-A3) |
|-----------|-------------------------------|------|--|
| HWD | Hazardous waste disposed | [kg] | 1,43E-02 |
| NHWD | Non hazardous waste disposed | [kg] | 6,02E-01 |
| RWD | Radioactive waste disposed | [kg] | 7,96E-05 |
| CRU | Components for re-use | [kg] | 0 |
| MFR | Materials for recycling | [kg] | 5,68E-02 |
| MER | Materials for energy recovery | [kg] | 0 |
| EEE | Exported electrical energy | [MJ] | 0 |
| EET | Exported thermal energy | [MJ] | 0 |

5. LCA: Interpretation



According to the previous chart, it is possible to state that the stage which contributes to a greater environmental burden in all categories is the assembly and finishing.

Global Warming Potential (GWP)

The use of cork contributes to fixation of carbon dioxide however it is not enough to cancel the resulting emissions from the process. These emissions are greatly due to PVC and electricity use in assembling stage.

Depletion Potential of the Stratospheric Ozone Layer (ODP)

Ozone layer depletion is caused by different substances, where the most relevant are fluorine-chlorine-hydrocarbons (CFC's) and nitrogen oxides. The impacts on this category are greatly associated to assembling and finishing stage as well as production of cork layer due to the use of materials and electricity consumption. The combustion process of fossil fuels associated to electricity production and the natural gas used in production of UV PVC varnishes and production of components of the varnishes are the main responsible to these impacts. Production of agglomerate cork layer is also significant to these impacts, mainly due to the use of a resin, which has associated to its production process the combustion of natural gas, and electricity consumption.

Acidification Potential of land and water (AP)

Acidification of water and soils has very damaging effects on ecosystems and is caused by transformation of air pollutants into acids. Assembling and finishing stage is the most significant to this effect, being responsible for more than 70% of the impacts in this category. This is mainly due to the use of electricity, considering that its production results in emissions of sulfur dioxide, nitrogen oxides, ammonia and other pollutants that can be converted into acids. The emissions from the production of PVC layers have also a significant impact in this category. The electricity consumption and emissions from thermal energy in production of agglomerate cork are also significant to this impact.

Eutrophication Potential (EP)

Eutrophication is caused by anthropogenic emissions, pollutants in waste water and fertilization of soils. It results in an increased concentration of nutrients,

causing various damages to the ecosystems. Phosphate, nitrites and ammonia are the main pollutants that contribute to this effect.

The stages with more significant impacts in this category are assembling and finishing and agglomerate pressed cork, with 54,3% and 44,7% of the total impacts. Electricity used in this process is responsible for about 24% of these burdens, due to emission of pollutants associated to combustion of fossil fuels. Production of PVC layer also contributes to about 15% of the impacts. In production of agglomerate cork, emissions resulting from thermal energy production have also a significant weight in this impact category.

Photochemical Ozone Creation Potential (POCP)

Production of ozone at ground-level (troposphere) is harmful for ecosystems and humans. It is caused by the chemical reaction between nitrogen oxides with hydrocarbons (VOCs), producing different pollutants, including ozone. Most of the tropospheric ozone is created from the reactions between substances emitted from vehicles, industrial plants and vegetation. As was verified in other categories, the stage with more significant impacts in photochemical ozone creation potential is assembling and finishing, representing (72,3% of the total impacts). The potential impacts on this category are mainly due to electricity use during production stage and during the manufacturing of pre-products, namely PVC layers. Production of agglomerate cork has a significant contribution to these impacts, also due to electricity consumption in the process and in production of pre products, namely the agglomerating resin.

Potential for abiotic depletion of resources – elements for non-fossil resources (ADPE)

This category characterizes the depletion of non-energetic resources, reflecting the shortage of these materials in the geosphere. According to the results, the assembling and finishing stage is responsible for the most of the impacts of this category (87% of the impacts). These results are mainly due to extraction of raw materials used to produce the PVC layers. Production of agglomerate cork has a significant contribution, due to the use of the resin, resulting in consumption of resources.

Potential for abiotic depletion of resources – fossil fuels (ADPF)

This category characterizes the depletion of fossil fuels used. The impacts of assembling stage in abiotic depletion of fossil fuels are also more significant than in other stages of the production process (77,5% of total impacts). By analyzing the inputs and outputs of materials and energy associated with this phase, it is possible to determine that fossil fuels associated to electricity production and PVC layers are the main responsible for this impact category. Regarding production of agglomerate cork layer, the consumption of fossil fuels associated to production of a resin and electricity use represent the most representative contribution to these impacts.

Other considerations

The analyzed product requires the use of about 0,6% (mass) of varnishes with different compositions. Their composition was obtained from suppliers and

producers that provided the information in a range of percentage of weight. Since the considered varnish quantity and composition results from this average of a range of values, this is where it is considered to be the

higher level of uncertainty in the overall assessment. The data sets used in modeling comply with the requirements in data quality referred to in standard /CEN/TR 15941:2010/.

6. Requisite evidence

6.1 VOC emissions and other indoor air quality parameters

French legislation

Corkcomfort Glue-down HPS 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.106/11 |
| 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 $1,25 \text{ m}^3 \text{ h}^{-1} \text{ m}^{-2}$ are presented in the following table.

| Substance | Concentration ($\mu\text{g}/\text{m}^3$) | | | |
|--------------------------|--|-------|-------|-------|
| | 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 |
| Phtalate de bis (2-ethylhexyle) | <1 |
| Phtalate 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 Indoor Air Quality (IAQ) Certification

This product has also been certified according to the GREENGUARD Indoor Air Quality (IAQ) Certification Program for Low Emitting Products.

| | |
|-------------------------------|---|
| Certification Program: | GREENGUARD Indoor Air Quality (IAQ) Certification Program for Low Emitting Products |
| Number of test report: | 5627-410 |
| Reference Standard: | GGPS.001 GREENGUARD IAQ Standard 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: | GREENGUARD Children & Schools Certification Criteria |
| Number of test report: | 5627-420 |
| Reference Standard: | GGPS.002 GREENGUARD Children & Schools SM Standards |

| 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 | $\leq 0,0135 \text{ ppm} / 13,5 \text{ ppb}$ (Office Seating $\leq 0,00675 \text{ ppm} / 6,75 \text{ ppb}$) |
| TVOC | $\leq 0,22 \text{ mg}/\text{m}^3$ |
| Total Aldehydes | $\leq 0,043 \text{ ppm} / 43 \text{ ppb}$ |
| 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.

7. References

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

ISO 10874

DIN EN ISO 10874:2012-04, Resilient, textile and
laminated floor coverings - Classification (ISO
10874:2009); German version EN ISO 10874:2012

ISO 14025

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

EN 15804

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

EN 655

DIN EN 655:2011-07, Resilient floor coverings - Tiles
of agglomerated composition cork with polyvinyl
chloride wear layer - Specification

EN 14041

DI EN 14041:2008-05, Resilient, textile and laminate
floor coverings - Essential characteristics

Ecoinvent database v2.2

Swiss Centre for Life Cycle Inventories (ecoinvent
Centre) EMPA St. Gallen Lerchenfeldstrasse 5 CH-
9014 St. Gallen www.ecoinvent.org

European Waste Catalogue Directive

2000/532/EC: Commission Decision of 3 May 2000
replacing Decision 94/3/EC establishing a list of
wastes pursuant to Article 1(a) of Council Directive
75/442/EEC on waste and Council Decision 94/904/EC
establishing a list of hazardous waste pursuant to
Article 1(4) of Council Directive 91/689/EEC on
hazardous waste (notified under document number
C(2000) 1147)

European Waste Framework Directive

Directive 2008/98/EC of the European Parliament and
of the Council of 19 November 2008 on waste and
repealing certain Directives



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