

ENVIRONMENTAL PRODUCT DECLARATION

as per /ISO 14025/ and /EN 15804/

| | |
|--------------------------|--------------------------------------|
| Owner of the Declaration | James Halstead PLC |
| Programme holder | Institut Bauen und Umwelt e.V. (IBU) |
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SIMPLAY® Design Vinyl Tile - Resilient Vinyl Floor Covering James Halstead PLC

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1. General Information

James Halstead PLC

Programme holder

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

Declaration number

EPD-JHA-20190096-ICA1-EN

This declaration is based on the product category rules:

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

Issue date

20.09.2019

Valid to

19.09.2024

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

Dr. Alexander Röder
(Managing Director IBU)

SIMPLAY® Design Vinyl Tile - Resilient Vinyl Floor Covering

Owner of the declaration

James Halstead PLC
Beechfield, Hollinhurst Road, Whitefield,
Manchester, M261JN, UK

Declared product / declared unit

SIMPLAY® DESIGN VINYL TILE - Resilient Vinyl Floor Covering, 1m² (A1-A3: produced, incl. A5: installed)

Scope:

SIMPLAY® Design Vinyl Tile from James Halstead plc, Manchester, UK. The declaration refers to a loose laid floor covering of thickness 5.0mm with a 0.7mm transparent wear layer. The products are manufactured in Choongnam Province, South Korea. The product is distributed by Objectflor Art Und Design Belags GmbH, Your Flooring Partner.

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

Angela Schindler
(Independent verifier appointed by SVR)

2. Product

2.1 Product description / Product definition

SIMPLAY® Design Vinyl Tiles from James Halstead PLC are luxury, highly decorative resilient vinyl floor coverings of 5.0mm total thickness with a 0.7mm clear wear layer that are loose laid. SIMPLAY® Design Vinyl Tile is manufactured strictly in accordance with /EN ISO 10582/. The uppermost surface is treated with a reinforced PUR surface coating offering enhanced resistance to dirt pick up and staining. The uppermost surface also encompasses emboss impressions to give the product a natural wood, stone or design impression along with slip performance class DS to /EN 13893/ and R10 to /DIN 51130/. The resilience and life time of the product is imparted with the 0.7mm clear wear layer which meets Type 1 >80% for binder content according to /EN ISO 10582/ with over 97% binder. The decorative design is achieved through the use of a 0.07mm printed vinyl film comprising wood, design and stone images with high definition realistic impressions.

The product's performance with regards to resistance to dimensional stability changes and residual indentation is imparted with the use of specially

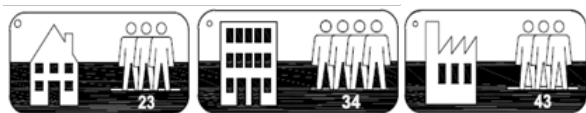
engineered and formulated high density core and backing layers.

For the placing on the market of the product in the 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

SIMPLAY® Design Vinyl Tile features a highly resilient 0.7mm clear wear layer and is a floor covering for extremely heavy traffic areas in domestic, commercial and industrial applications.

SIMPLAY® Design Vinyl Tile is a high performance resilient floor covering for commercial and professional use e.g. in Retail Shops and Stores, Schools, Healthcare, Office and Administration areas. SIMPLAY® Design Vinyl Tile is use classified as 23, 34, 43 according to /EN ISO 10874/ (EN 685).



2.3 Technical Data

Excerpt of technical data sheets are available at www.Objectflor.de or www.Polyflor.com

Constructional data

| Name | Value | Unit |
|--|------------------|------------------|
| Product thickness EN ISO 24346 | 5 | mm |
| Grammage EN ISO 23997 | 7987 | g/m ² |
| Abrasion Class EN ISO 10582 | Type 1 ; 97% | - |
| Product Form | Tiles and planks | - |
| Length of the surface layer (planks) | 1505 | mm |
| Width of the surface layer (planks) | 185 | mm |
| Length and width of squared elements (tiles) | 600 | mm |

Performance data of the product in accordance with the declaration of performance with respect to its essential characteristics according to EN 14041:2018 – Resilient, textile, laminate and modular multilayer floor coverings. - Essential characteristics.

2.4 Delivery status

Delivery of tiles up to 600 x 600 mm and planks 185 x 1505 mm in cardboard packages of average 2.2 m².

2.5 Base materials / Ancillary materials

The product has the following composition:

| Component | % Total Composition |
|----------------------|---------------------|
| PVC | 38.28% |
| Filler | 44.73% |
| Plasticiser | 14.06% |
| Stabiliser | 1.64% |
| Pigment/additive | 0.65% |
| Glass fibre | 0.41% |
| Polyurethane coating | 0.22% |

This product contains substances listed in the candidate list (date: 23.07.2019) exceeding 0.1 percentage by mass: no.

This product contains other 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 layers are all laminated together under high temperature and pressure in a pressing machine, either continuously or as a batch process, to form a heterogeneous sheet. At the same time, the corresponding realistic emboss feel effect is applied.

After cooling and conditioning reinforced PUR coating is applied to the surface and the master sheets annealed to relax out. These sheets are then cut in a controlled environment into the respective plank and tile sizes with a supplementary bevelled edge being added to some designs. Finally the floor coverings are packaged (see chapter 2.10). All left overs that arise during production (trimming, cutting, defect product and bevelled leftovers) are recycled back into the calendaring process to make new flooring, in a closed loop, internal recycling system.

Manufacturing is carried out using a quality management system that conforms to /ISO 9001/.

2.7 Environment and health during manufacturing

Since 2000, the environmental management system is certified to ISO 14001 - Environmental management systems (/ISO 14001/).

Air: the exhaust air resulting from production processes is cleaned according to local legal requirements. Emissions are significantly below the permitted tolerances.

Water/Soil: Contamination of water and soil does not occur. Effluent resulting from production processes is processed internally and routed back to production. The quality of water is audited on a regular basis.

Noise protection: noise intensive systems such as granulation are structurally enclosed and controlled.

2.8 Product processing/Installation

The relevant installation instructions can be found on the Objectflor website. The appropriate tools for installing vinyl resilient flooring should be used such as a rule, craft knife, measure. Care should be taken when using sharp tools.

The installation of the floor covering is based on the technical regulations of /DIN 18365/.

When installing loose laid resilient floorings permanent adhesive systems are often not required. Observe all liability insurance association regulations for commercial processing operations where appropriate. Waste vinyl material accumulated on site (off cuts) shall be collected and separated into waste types. Vinyl can be recycled using the AgPR recycling facility. Any other disposal methods such as landfill and incineration should comply with local waste disposal authority instructions. Where possible though, vinyl products should always be recycled.

2.9 Packaging

SIMPLAY® Design Vinyl Tile is packed in cardboard packages. Packaging material and transportation aids such as wooden pallets, cardboard, paperboard PET strapping and recyclable PE film should be collected separately for recycling after initial use.

2.10 Condition of use

The product is vinyl resilient floor covering. The product is inert in its supplied state.

2.11 Environment and health during use

According to the current state of knowledge, no hazards to water, air and soil occur during the proper use of the described products.

No damage to health or impairment is expected under normal use corresponding to the intended use of resilient flooring. Indoor Air Quality VOC emissions are

independently monitored at least three times annually for performance; detailed further in section 7.

2.12 Reference service life

A reference service life (RSL) for this product cannot be declared according to /ISO 15686-1, -2, -7 and -8/. However, a service life of 20 years is declared in accordance with /BBSR/ (Code number 352.711). It should be noted that a service life in accordance with the BBSR table is not a RSL according to ISO 15686. As no reference service life has been declared, the LCA results of module B2 refer to a period of one year, as allowed for by the inclusion of the rule on useful life from /ISO 16810/ in PCR part B.

2.13 Extraordinary effects

Fire

Flammability rating Bfl according to /EN 13501-1/ (Exova Warrington Fire, Notified Body 0833, December 2013, test report 336224).

Fire protection

| Name | Value |
|---|--------|
| Building material class /EN 13501-1+A1/ | Bfl s1 |

Water

Component materials that could be hazardous will not be washed out when water is applied. It is clear that

water on the surface could present potentially a slip hazard. Water spillages should be cleared immediately. For areas where water and contaminants are frequent, an /EN 13845/ safety flooring is advised.

Mechanical destruction

Abrasion and impact loading classification see product definition in this EPD. The dragging of heavy objects across the floor can cause damage and breaking of edges (risk of injury).

2.14 Re-use phase

Loose laid vinyl flooring can easily be removed for re-use in an alternative installation or for end of life recycling. Loose laid vinyl tiles can be recycled and put back into new flooring

2.15 Disposal

Vinyl Flooring: leftovers which arise from construction site as well as those from deconstruction measures should be primarily routed to a material utilisation stream such as AgPR.

2.16 Further information

Certified by the CSTB for an Avis Technique for France. The classification is U4 P3 E2 C2. The approval number is: No AC2014220. See the CSTB website for copies of certificates www.cstb.fr. The product is also classed generic A+ for use in major use such as Healthcare and Education areas according to the BRE EAM Life Cycle Analysis (LCA). See the Green Guide to Specification live database at www.greenbooklive.co.uk

3. LCA: Calculation rules

3.1 Declared Unit

Declared unit

| Name | Value | Unit |
|---------------------------|-------|----------------|
| Declared unit | 1 | m ² |
| Conversion factor to 1 kg | 0.125 | - |

The robustness of the LCA values reported in this EPD are considered to be relatively high. The production process has been operating for many years and the manufacturer confirms that this has not changed significantly over the last five years. The underlying LCA model has been adapted to the region of production - using the South Korean grid mix and key raw materials modelled as being sourced from China. Production of raw materials (modelled using background data) accounts for the largest proportion of impacts in most categories so it is important that these are as representative as possible of the actual supply chain.

3.2 System boundary

Type of EPD: cradle to gate with options.

Modules A1-A3 include processes that provide materials and energy input for the system, manufacturing and transport processes up to the factory gate, as well as waste processing.

Module A4 includes transport of the floor covering to the place of installation.

Module A5 includes the installation of the floor covering, the production of excess material that

becomes the off-cuts and incineration or recycling of off-cuts and packaging material.

Module B1 covers use/application (module not declared in this EPD).

Module B2 accounts for maintenance during use and includes provision of cleaning agent, energy and water consumption for the cleaning of the floor covering incl. waste water treatment. The LCA results in this EPD are declared for a one year usage.

Modules B3-B7 cover repair, maintenance, replacement, refurbishment and operational energy and water use (these modules are not declared in this EPD).

Module C1 considers impacts associated with deconstructing the flooring. For this case of SIMPLAY® Design Vinyl Tile this can be done by hand and so these are zero

Module C2 includes transportation of the post-consumer waste to waste processing.

Module C3/1 models the 100% recycling scenario and accounts for the granulation process required prior to recycling.

Module C3/2 models the 100% incineration scenario and accounts for incineration in a waste incinerator with R1>0.6.

Module C4 considers disposal of the waste product arising at the end of life for SIMPLAY® Design. No waste is generated during the modelled end of life scenarios in this EPD so these impacts are zero.

Module D/1 models the 100% recycling scenario and accounts for the potential benefits and loads from all net flows referring to module A5.

Module D/2 models the 100% incineration scenario and accounts for the potential benefits and loads from

all net flows referring to modules A5 and C3/2 (incineration).

3.3 Estimates and assumptions

Existing inventory data were not available for the particular plasticiser used in Simplay® Design Vinyl Tiles so this was modelled based on an alternative plasticiser as a proxy. As plasticiser accounts for over 14% of the product composition this may have a reasonable influence on the results.

Datasets for PVC, filler stabiliser and plasticiser were modelled based on European production routes but with energy inputs adapted to the Chinese situation. It is expected that the underlying technology will be the same in both locations so simply adapting the energy mixes used is likely to be broadly representative of production in China.

Carbon black has been used to represent all dyes and pigments used in Simplay® Design Vinyl Tiles. Clearly these can vary greatly and each pigment or mix of pigments will have its own particular environmental burdens. However, as the overall content of pigments used is less than 1% this assumption is unlikely to have a significant influence on the results of the EPD. The methodological approach of recycling materials in this study does consider processing required to prepare the material (electricity for grinding) in module A1-A3. In the end of life scenario the material for recycling leaves the system without environmental burden and without reporting any potential benefits.

3.4 Cut-off criteria

In the assessment, all available data from production are considered, i.e. raw materials used, utilised thermal energy, and electric power consumption. Thus material and energy flows contributing less than 1% of mass or energy are considered. It can be assumed that the total sum of neglected processes does not exceed 5% of energy usage and mass. The manufacturer provided data on the transport expenditure for all relevant material flows. Machines and facilities required during production are neglected.

3.5 Background data

For life cycle modelling of the considered products, the GaBi Software System for Life Cycle Engineering, developed by thinkstep AG, has been used to model the product systems considered in this assessment. All relevant background datasets are taken from the GaBi

9 software database. The datasets from the GaBi database (Service Pack 37) are documented in the online documentation /GaBi 9 2019/. To ensure comparability of results in the LCA, the basic data of GaBi database were used for energy, transportation and auxiliary materials.

3.6 Data quality

The primary data collected from the manufacturer are based on annual quantities, or are projected from measurements on the specific facility for the reporting period. The data quality can be described as good. The primary data collection has been done thoroughly and all relevant flows are considered. Technological, geographical and temporal representativeness is given.

The /GaBi 9/ database contains datasets for most of the basic materials used in the product formulation. The latest update of the database was in 2019. Further datasets in the upstream chain of the basic material production have been approximated with datasets on similar chemicals or are estimated by consolidation of existing datasets.

3.7 Period under review

The period under review is the year 2018.

3.8 Allocation

Allocation of foreground data

The manufacturing process does not create any by-products. As such, the software model does not include any allocation.

However, foreground data provided by James Halstead for SIMPLAY® Design Vinyl Tile has been extracted from total site production of the facility (which includes production of other products beside the declared product family). James Halstead has used allocation keys of mass, area and production volumes in the plant to provide foreground data pertaining to SIMPLAY® Design Vinyl Tile. Specific information on allocation the background system is given in the GaBi datasets documentation.

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

The following technical information serves as basis for the declared modules. The values refer to the declared unit of 1 m².

Transport to the construction site (A4)

| Name | Value | Unit |
|---|--------|---------|
| Litres of fuel (EURO 6 Truck) | 0.0054 | l/100km |
| Transport distance (average truck) | 2000 | km |
| Capacity utilisation (including empty runs) | 85 | % |
| Litres of fuel (shipping) | 0.0013 | l/100km |
| Transport distance (average ship) | 23177 | km |
| Capacity utilisation (shipping) | 48 | % |

Installation in the building (A5)

| Name | Value | Unit |
|------|-------|------|
|------|-------|------|

| | | |
|---------------|-----|---|
| Material loss | 4.5 | % |
|---------------|-----|---|

Maintenance (B2)

The data below refer to the cleaning requirements for 1 year of use.

| Name | Value | Unit |
|-------------------------------|-------|----------------|
| Water consumption | 0.003 | m ³ |
| Electricity consumption | 0.55 | kWh |
| Maintenance cycle (per year) | 156 | Number/yr |
| Cleaning agent (25% solution) | 0.04 | kg |

A reference service life (RSL) for this product cannot be declared according to /ISO 15686-1, -2, -7 and -8/, although a service life of 20 years is declared according to /BBSR/ (see section 2.12)

As no reference service life has been declared, the LCA results of module B2 refer to a period of one year.

Reference service life

| Name | Value | Unit |
|-------------------------------|-------|------|
| Life Span (according to BBSR) | 20 | a |

End of Life (C1-C4)

Two scenarios are reported for end of life:

- Scenario 1 is for 100% recycling
- Scenario 2 is for 100% incineration with energy recovery in a waste incineration plant with ($R1 > 0.6$).

| Name | Value | Unit |
|----------------------------------|-------|------|
| Recycling (EoL scenario 1) | 7.987 | kg |
| Energy recovery (EoL scenario 2) | 7.987 | kg |

5. LCA: Results

As noted in section 2.12 a reference service life (RSL) for this product cannot be declared according to /ISO 15686-1, -2, -7 and -8/. Accordingly, the LCA results of module B2 refer to a period of one year, as allowed for by the inclusion of the rule on useful life from /EN 16810/ in PCR part B. Hence, to calculate the impact potential of the use phase for a given application service life the values for module B2 must be multiplied by the estimated service life in years.

This assessment applies impact assessment methods based on /CML 2001/.

Two end of life scenarios are modelled. Scenario 1 (reported in modules C3/1 and D/1) refers to the case where 100% of the post-consumer waste is recycled. Scenario 2 (reported in modules C3/2 and D/2) refers to the case where 100% of the post-consumer waste is sent for energy recovery.

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 | X | X | MND | X | MNR | MNR | MNR | MND | MND | X | X | X | X | X |

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: 1 m² installed SIMPLAY® Design Vinyl Tile

| Parameter | Unit | A1-A3 | A4 | A5 | B2 | C1 | C2 | C3/1 | C3/2 | C4 | D/1 | D/2 |
|-----------|--|----------|----------|----------|----------|---------|----------|----------|----------|---------|-----------|-----------|
| GWP | [kg CO ₂ -Eq.] | 1.43E+1 | 3.57E+0 | 1.76E+0 | 2.73E-1 | 0.00E+0 | 1.89E-1 | 1.70E+0 | 1.23E+1 | 0.00E+0 | -2.15E-1 | -3.03E+0 |
| ODP | [kg CFC11-Eq.] | 5.87E-10 | 4.74E-16 | 2.79E-11 | 6.46E-15 | 0.00E+0 | 3.11E-17 | 6.59E-14 | 4.92E-12 | 0.00E+0 | -2.71E-15 | -3.57E-14 |
| AP | [kg SO ₂ -Eq.] | 8.38E-2 | 8.15E-2 | 8.29E-3 | 7.13E-4 | 0.00E+0 | 1.59E-4 | 3.13E-3 | 1.04E-2 | 0.00E+0 | -3.43E-4 | -4.63E-3 |
| EP | [kg (PO ₄) ³ -Eq.] | 6.60E-3 | 8.79E-3 | 7.55E-4 | 8.75E-5 | 0.00E+0 | 3.60E-5 | 4.34E-4 | 5.24E-4 | 0.00E+0 | -3.79E-5 | -5.19E-4 |
| POCP | [kg ethene-Eq.] | 8.31E-3 | 4.32E-3 | 6.10E-4 | 5.94E-5 | 0.00E+0 | 5.94E-7 | 2.04E-4 | 2.66E-4 | 0.00E+0 | -2.80E-5 | -3.86E-4 |
| ADPE | [kg Sb-Eq.] | 5.95E-5 | 1.39E-7 | 2.97E-6 | 1.18E-7 | 0.00E+0 | 1.45E-8 | 6.76E-7 | 3.48E-6 | 0.00E+0 | -3.63E-8 | -4.88E-7 |
| ADPF | [MJ] | 2.90E+2 | 4.50E+1 | 1.65E+1 | 3.39E+0 | 0.00E+0 | 2.55E+0 | 1.70E+1 | 1.48E+1 | 0.00E+0 | -3.10E+0 | -4.43E+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 | | | | | | | | | | | |

RESULTS OF THE LCA - RESOURCE USE: 1 m² installed SIMPLAY® Design Vinyl Tile

| Parameter | Unit | A1-A3 | A4 | A5 | B2 | C1 | C2 | C3/1 | C3/2 | C4 | D/1 | D/2 |
|-----------|---|---------|---------|---------|---------|---------|---------|----------|----------|---------|----------|----------|
| PERE | [MJ] | 2.99E+1 | 8.63E-1 | 1.70E+0 | 1.69E+0 | 0.00E+0 | 1.49E-1 | 1.19E+1 | 6.56E+0 | 0.00E+0 | -7.04E-1 | -9.30E+0 |
| PERM | [MJ] | 3.81E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | -3.81E+0 | -3.81E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 |
| PERT | [MJ] | 3.23E+1 | 8.63E-1 | 1.70E+0 | 1.69E+0 | 0.00E+0 | 1.49E-1 | 8.09E+0 | 2.75E+0 | 0.00E+0 | -7.04E-1 | -9.30E+0 |
| PENRE | [MJ] | 2.10E+2 | 4.52E+1 | 1.70E+1 | 5.10E+0 | 0.00E+0 | 2.56E+0 | 1.94E+1 | 1.08E+2 | 0.00E+0 | -3.81E+0 | -5.36E+1 |
| PENRM | [MJ] | 9.18E+1 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | -9.18E+1 | -9.18E+1 | 0.00E+0 | 0.00E+0 | 0.00E+0 |
| PENRT | [MJ] | 2.99E+2 | 4.52E+1 | 1.70E+1 | 5.10E+0 | 0.00E+0 | 2.56E+0 | -7.24E+1 | 1.65E+1 | 0.00E+0 | -3.81E+0 | -5.36E+1 |
| SM | [kg] | 1.67E+0 | 0.00E+0 | 7.87E-2 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 6.24E+0 | 0.00E+0 |
| 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 |
| 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 |
| FW | [m ³] | 1.30E-1 | 1.48E-3 | 8.46E-3 | 2.17E-3 | 0.00E+0 | 2.51E-4 | 8.44E-3 | 3.41E-2 | 0.00E+0 | -8.31E-4 | -1.10E-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 – OUTPUT FLOWS AND WASTE CATEGORIES:

1 m² installed SIMPLAY® Design Vinyl Tile

| Parameter | Unit | A1-A3 | A4 | A5 | B2 | C1 | C2 | C3/1 | C3/2 | C4 | D/1 | D/2 |
|-----------|---|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------|----------|
| HWD | [kg] | 3.55E-6 | 7.41E-7 | 2.07E-7 | 2.39E-9 | 0.00E+0 | 1.43E-7 | 1.64E-8 | 1.09E-7 | 0.00E+0 | -1.55E-9 | -2.15E-8 |
| NHWD | [kg] | 2.16E-1 | 1.27E-3 | 2.86E-1 | 6.15E-3 | 0.00E+0 | 2.08E-4 | 2.25E-2 | 6.07E+0 | 0.00E+0 | -1.55E-3 | -2.08E-2 |
| RWD | [kg] | 3.48E-3 | 5.62E-5 | 2.01E-4 | 6.78E-4 | 0.00E+0 | 3.48E-6 | 2.71E-3 | 6.61E-4 | 0.00E+0 | -2.81E-4 | -3.71E-3 |
| CRU | [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 |
| MFR | [kg] | 0.00E+0 | 0.00E+0 | 9.41E-2 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 7.99E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 |
| MER | [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 |
| EEE | [MJ] | 0.00E+0 | 0.00E+0 | 9.97E-1 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 1.22E+1 | 0.00E+0 | 0.00E+0 | 0.00E+0 |
| EET | [MJ] | 0.00E+0 | 0.00E+0 | 2.13E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 2.94E+1 | 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; EEE = Exported thermal energy | | | | | | | | | | | |

The negative values for PERM and PENRM in C3/1 and C3/2 are due to the rebooking of this energy to the next life cycle for scenario 1, or to reflect its conversion from feedstock to fuel energy upon combustion for scenario 2. The value for MFR in A5 is due to recycling of paper packaging.

6. LCA: Interpretation

The main contributors to most of the environmental impacts and the demand on primary energy are from the basic material provision (A1), with a lesser contribution from energy use during manufacturing (A3).

Transport to customer (A5) has a large contribution for AP, EP and POCP due to the long transport distance by ship and truck from the production site in Korea to the customer in Europe.

The 100% energy recovery EoL scenario shows large GWP impacts associated with waste treatment processes (C3/2).

Differences in values from this EPD in comparison to the 2014 EPD are a results of updated background data and to modelling different scenarios for end of life. No foreground data were changed as total production inputs and outputs were assumed to remain the same.

7. Requisite evidence

Indoor Air Quality - VOC Accreditation

/DIBt/: Z.156.603-992 - external audits and surveillance monitoring by Eurofins Product Testing A/S, Galten, Denmark

Test Report: Determination of the VOC emissions from SIMPLAY Design Vinyl according to the AgBB (German operation working committee) method (inspection report approval number Z-156.603-992) from 11/10/2016).

Method: Testing in a 0.25m³ chamber on the basis of the AgBB Method ISO 16000 series. Result: According to the AgBB evaluation method, the tested product complies with the requirements of the DIBt (October 2010) for use in the indoor environment.

/Eurofins v6.0 (2017)/: Compliance and external surveillance of VOC by Eurofins Product Testing A/S, Galten, Denmark. For updated copies of certification please ask Objectflor or see www.eurofins.com/iaccertified.aspx.

Testing Institute: Eurofins DK, Galten, Denmark Test Report: Determination of the VOC emissions from SIMPLAY Design Vinyl according to the AgBB (2012) method and Indoor Air Comfort v6.0 (2017) inspecting both the factory production according to DIN 18200 and VOC testing according to CEN/TS 16516 and the ISO 16200 series and by an ISO 17025 accredited laboratory (certificate number IACG-107-02-2017) from 08/05/2017.

Result: According to the evaluation methods the product complies with the requirements of Indoor Air Comfort GOLD for use in the indoor environment.

/French Regulation -L'etiquetage sanitaire des produits de construction/:

Determination of the VOC emissions from Expona Design according to the French Regulation method (certificate number IACG-107-02-2017) from 08/05/2017.

Method: Testing in a 0.25m³ chamber on the basis ISO 16000 series series.

Result: According to the French evaluation method, the tested product complies achieves- Class A+ - L'etiquetage sanitaire des produits de construction. Decret no 2011-321 du mars 2011 relatif a l'etiquetage des produits de construction ou de revetement de mur ou de sol et des peintures et vermis sur leurs emissions de polluants volatils.

SCS FloorScore: Indoor Air Quality Certified to /SCS-EC-10.3-2014/. Conforms to California Specification 01350 (standard method v1.1) for the school classroom and private office parameters; also in compliance with 9µg/m³ formaldehyde CREL for all parameters. Registration SCS-FS-02906 valid from 01/10/18.

For current live certification please see: www.scs-certified.com/products or ask Objectflor.

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AgPR

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CML 2001

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CSTB

Centre Scientifique et Technique du Bâtiment

DIBt

Deutsches Institut für Bautechnik

Expona Design

James Halstead PLC Expona Simplay Wood PUR loose lay tiles

French Regulation -L'etiquetage sanitaire des produits de construction.

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