

ENVIRONMENTAL PRODUCT DECLARATION

as per /ISO 14025/ and /EN 15804/




Owner of the Declaration	Parador GmbH
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
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Valid to	05.03.2024

Resilient floor coverings
Parador GmbH

www.ibu-epd.com / <https://epd-online.com>



1. General Information

Parador GmbH Programme holder IBU - Institut Bauen und Umwelt e.V. Panoramastr. 1 10178 Berlin Germany	Resilient floor coverings Owner of the declaration Parador GmbH Millenkamp 7-8 D-48653 Coesfeld, Germany
Declaration number EPD-PAR-20180164-IBC1-EN	Declared product / declared unit The declared unit is one square meter (1 m ²) of resilient floor coverings.
This declaration is based on the product category rules: Floor coverings, 02/2018 (PCR checked and approved by the SVR)	Scope: This EPD relates to the manufacture, transport, installation, and disposal of an average square metre of Parador resilient floor coverings. The technical characteristics are described in chapter 2.3. The product is manufactured in Coesfeld, Germany. The owner of the declaration is liable for the underlying information and evidence; IBU is not liable for manufacturer information, ecological assessment data, and verification.
Issue date 06.03.2019	The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.
Valid to 05.03.2024	Verification The standard /EN 15804/ serves as the core PCR Independent verification of the declaration and data according to /ISO 14025:2010/ <input type="checkbox"/> internally <input checked="" type="checkbox"/> externally
 Prof. Dr.-Ing. Horst J. Bossenmayer (President of Institut Bauen und Umwelt e.V.)	 Patricia Wolf (Independent verifier appointed by SVR)
 Dr. Alexander Röder (Managing Director IBU)	

2. Product

2.1 Product description / Product definition

Modular ONE

The multi-layered structure of the Modular ONE flooring is characterised by the coating of decor paper with the plasticiser-free material polypropylene. This coating allows for an authentic structuring of the decor paper and thus enables the realistic reproduction of real wood surfaces.

The core material of the Modular ONE flooring is a high-density fibreboard, which is specially adapted for wet rooms. It gives the floor a flexible strength and thanks to its special coating guarantees water resistance of the flooring for up to 4 hours in the case of standing water.

Eco Balance PUR

Similar to the Modular ONE flooring, Eco Balance PUR is a coated high-density fibreboard. The decor layer consists of the plasticiser-free material polyurethane, which is produced from renewable resources. This coating allows for an authentic structuring of the decor paper and thus enables the realistic reproduction of real wood surfaces.

The /EU Regulation No. 305/2011/ (Construction Products Regulation) applies for placing the product on the market in the European Union/EFTA (with the exception of Switzerland). The product requires a declaration of performance taking into account the harmonised standard /DIN EN 14041: Resilient, textile, laminate and modular multi-layer flooring - Essential characteristics; German version /EN 14041:2018/and the CE marking. The respective national regulations apply for the use.

2.2 Application

Resilient floor coverings are suitable for private and commercial indoor use. They are either laid floating on screed or other existing subfloors in conjunction with suitable underlays (insulating underlays) or glued to the full surface of the screed. The principles of proper installation are available in the enclosed installation instructions or in the "Resilient floor coverings advice section".

2.3 Technical Data

Constructional data

Name	Value	Unit
Product thickness	8	mm
Wear class (Modular ONE)	23/33	
Wear class (Eco Balance PUR)	23/32	
Surface weight (Modular ONE)	6500-6800	g/m ²
Surface weight (Eco Balance PUR)	8300-8600	g/m ²
Length of the surface layer	according to current type list	mm
Width of the surface layer	according to current type list	mm
Type of manufacture	Lamination	-
Layer thickness (Top layer)	N.r.	mm
Abrasion Class	N.r.	-
Product Form	N.r.	-
Yarn type	N.r.	-
Pile fibre composition	N.r.	%
Total thickness	N.r.	mm
Total carpet weight	N.r.	g/m ²
Surface pile thickness	N.r.	mm
Number of tufts or loops	N.r.	pce/dm ²
Surface pile weight	N.r.	g/m ²
Secondary backing	N.r.	-
Density	N.r.	kg/m ³

N.r.: not relevant (for resilient floor coverings). The data of the declaration of performance is authoritative.

You will find the declarations of performance at:

Modular ONE:

https://media.parador.eu/media/pdf/a1/53/d1/20180101_DOP_PI-7401200-080-550_DE-EN_ModularONE.pdf

Eco Balance PUR:

https://media.parador.eu/media/pdf/15/47/68/20170630_DOP_PI-7401200-080-000_DE-EN_PUR_8-0mm.pdf

Technical information can be found at:

Modular ONE:

https://media.parador.eu/media/pdf/f7/4a/b2/Parador_Tech_DE_ModularONE.pdf

Eco Balance PUR:

https://media.parador.eu/media/pdf/db/b7/26/20180901_PA_TDS_Eco-Balance-PUR_DE.pdf

Certificates can be found at:

<https://www.parador.de/service/katalogedownloads/zerifikation>

2.4 Delivery status

Modular ONE		
Product features		
Format / Packaging	according to current type list	
Tolerances (requirement EN 16511)		
Perpendicularity of the element ($\leq 0.20\text{mm}$)		$\leq 0.15\text{mm}$
Determination of edge straightness ($\leq 0.30\text{mm/m}$)		$\leq 0.20\text{mm}$
Evenness concave/convex	longitudinal ($\leq 0.50/\leq 1.0\%$)	$\leq 0.35/\leq 1.0\%$
	wide ($\leq 0.15/\leq 0.20\%$)	$\leq 0.10/\leq 0.15\%$
Surface flush	(mean $\leq 0.10\text{mm}$)	mean $\leq 0.10\text{mm}$
	(max $\leq 0.15\text{mm}$)	max $\leq 0.15\text{mm}$
Joint opening	(mean $\leq 0.15\text{mm}$)	mean $\leq 0.05\text{mm}$
	(max $\leq 0.20\text{mm}$)	max $\leq 0.10\text{mm}$
Warranty (according to Parador warranty terms)		Notes
Private area	Commercial area	- Not approved for whole-area gluing
Lifetime	10 years	- Cleaning and care see instructions
		- Subject to technical changes

Eco Balance PUR		
Product features		
Format / Packaging		according to current type list
Tolerances (requirement EN 16511)		
Perpendicularity of the element ($\leq 0.20\text{mm}$)		$\leq 0.20\text{mm}$
Determination of edge straightness ($\leq 0.30\text{mm}$)		$\leq 0.15\text{mm}$
Evenness concave/convex	longitudinal ($\leq 0.50/\leq 1.0\%$)	$\leq 0.35/\leq 1.0\%$
	wide ($\leq 0.15/\leq 0.20\%$)	$\leq 0.10/\leq 0.10\%$
Surface flush	(mean $\leq 0.10\text{mm}$)	mean $\leq 0.10\text{mm}$
	(max $\leq 0.15\text{mm}$)	max $\leq 0.15\text{mm}$
Joint opening	(mean $\leq 0.15\text{mm}$)	mean $\leq 0.10\text{mm}$
	(max $\leq 0.20\text{mm}$)	max $\leq 0.15\text{mm}$
Warranty (according to Parador warranty terms)		Notes
Private area	Commercial area	- Not approved for whole-area gluing
Lifetime	5 years	- Cleaning and care see instructions
		- Subject to technical changes

2.5 Base materials / Ancillary materials

The averaged share of ingredients per m² in mass percent for the EPD is as follows:

Average product:

HDF core board: 89%
Cork backing: 4%
PP wear/top layer: 2%
PUR wear/top layer: 4%
Dispersion glue: 1%

Modular ONE:

HDF core board: 92%
Cork backing: 4%
PP wear/top layer: 3%
Dispersion glue: 1%

Eco Balance PUR:

HDF core board: 74%
PUR wear/top layer: 22%
Cork backing: 3%
Dispersion glue: 1

The product/at least one subassembly contains substances from the candidate list (/ECHA/) (date 05.09.2018) above 0.1 mass percent: no.

The product/at least one subassembly contains additional CMR substances category 1A or 1B that are not on the candidate list (/ECHA/) above 0.1 mass percent in at least one subassembly: no.

No biocide products have been added to this building product and it has not been treated with biocide products (thus it is an untreated product in the sense of

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the Biocide Products Ordinance (EU) No. 528/2012):
yes.

2.6 Manufacture

The HDF core board, the wear layer, and the cork backing are pressed together using a glue. The planks are then provided with a longitudinal and transverse profile. After quality control of the individual flooring elements, they are packed in half-shell cartons and shrink-wrapped in PE film. These individual packaging units are stacked on pallets according to the different formats and made available in the warehouse for subsequent delivery. All processes are continually checked and documented as part of the in-house *Factory Production Control* (FPC).

2.7 Environment and health during manufacturing

Wood chips resulting from the production process are burned in a solid-fuel boiler to generate heat at the Coesfeld site.

Parador is certified according to the European Environmental Management System /EMAS/, which, in addition to environmental aspects, also reviews the energy aspects of the plant for continuous improvement.

2.8 Product processing/Installation

For the installation of modular flooring, Parador recommends the use of the following tools: measuring tape, cutter, adhesive tape, pencil, hammer, and jigsaw or circular/mitre saw (ensure the finest possible teeth and suitability for wood processing). Spacer wedges, drawbars, protective block, and a MultiTool are also useful. The usual safety precautions (e.g. safety goggles and dust mask when sawing) must be observed. The resulting shavings and sawdust should be extracted. The provisions of the employers' liability insurance association apply for industrial processing.

The residual material and packaging must be disposed of separately according to waste category.

Further information can be found in the installation instructions enclosed with the product or in the "Resilient floor coverings advice section" (https://media.parador.eu/media/pdf/b1/38/e9/DE_Parador_Ratgeber_Elastische-Bodenbel-ge.pdf).

2.9 Packaging

The planks are packed in half-shell cartons which are wrapped in PE shrink film for better protection against moisture. Exchangeable EURO pallets and PET strapping are also used for transport. All packaging components can be recycled pursuant to their category.

2.10 Condition of use

Wood is a hygroscopic material, i.e. it can absorb and release moisture. For use it is therefore important to ensure a balanced room climate in order to avoid possible dimensional changes. The room climate should be at a temperature of approx. 20°C and a relative humidity of 35 - 60% all year round.

2.11 Environment and health during use

There are no known negative effects between product, environment, and health. Risks to water, air, and soil cannot occur when used as intended. Emissions of pollutants are well below the legal limits. In terms of emission behaviour, the modular flooring meets the award criteria of /RAL-UZ176/ (Blue Angel) "Contract 27258 or 32508".

2.12 Reference service life

The /Sustainable Building Assessment System/ takes a useful life of 20 years as a basis under code no. 352.711.

2.13 Extraordinary effects

Fire

The following building material class according to /EN 13501-1/ is adhered to in the area of fire protection:

Fire protection

Name	Value
Building material class	Cfl
Smoke gas development	N.r.
Burning droplets	s1

N.r.: not relevant for resilient floor coverings

Water

An edge swell protection exists against short-term exposure to water. Resilient floor coverings are not resistant to permanent exposure to water; irreversible swelling is possible. However, a dangerous impact on the environment is not to be expected when exposed to water.

Mechanical destruction

Mechanical destruction is not expected to have any negative consequences for the environment.

2.14 Re-use phase

In case of selective dismantling, the product can easily be reused even after the end of the useful life. Residues and wastes from modular flooring must be recycled in accordance with /AVV 17 02 01/ and /AVV 20 01 38/. If repeated use of the product as flooring is no longer possible, then the high heating value of approx. 17 MJ/kg means that it can be thermally recycled to generate process heat and electricity. Open burning or burning in a chimney is not possible as the combustion of treated wood and plastics results in harmful emissions. Incineration should therefore take place in a plant with a connected flue gas cleaning system, such as a waste incineration plant.

2.15 Disposal

According to /AltholzV/, /AVV/ 17 02 01 and 20 01 38, placing old wood in a landfill is prohibited. Old wood category A II applies: glued, painted, coated, varnished, or otherwise treated old wood without organohalogen compounds in the coating and without wood preservatives.

2.16 Further information

Additional information about the company and other products as well as information brochures - including the EMAS Environmental Statement - can be downloaded at: www.parador.de

3. LCA: Calculation rules

3.1 Declared Unit

The declared unit is one square metre (1 m²) of resilient floor coverings including packaging material.

The average sales shares over 6 months for the Eco Balance PUR and Modular ONE products were used to calculate the average for this declaration. The variants contained in the average differ with regard to the wear layer material (PUR or PP).

Declared unit

Name	Value	Unit
Declared unit	1	m ²
Surface weight	6.457	kg/m ²
Packaging materials	0.099	kg/m ²
Total	6.556	kg/m ²
Conversion factor to 1 kg	0.153	-

3.2 System boundary

Type of EPD: Cradle to factory gate with options.

Modules A1-3, A4, and A5

The product stage (A1-3) begins with considering the production of the necessary raw materials and energies, including all corresponding upstream chains and the actual procurement transports. Furthermore, the entire manufacturing phase was mapped, including treatment of production waste until end-of-waste status (EoW) was reached. In addition, both the distribution transports from Coesfeld / DE (A4) and the packaging waste generated during installation (A5) were taken into account. Product losses as well as power consuming tools, auxiliary materials, and installation materials were not considered in A5.

Modules C2-C3

The modules include the environmental impacts for the treatment of the waste categories until end-of-waste status (EoW) is reached, including the associated transports at the end of the product life cycle.

Module D

Identification of the benefits and costs of the product outside the system boundary. These consist of energy credits from thermal utilisation (C3) in the form of the average European electricity mix or thermal energy from natural gas.

3.3 Estimates and assumptions

The ratio of wood waste generated in A1-A3 that is incinerated via the waste incineration route or at Parador was determined on the basis of an annual mean value and amounts to 45% to 55%. This ratio was also adopted for the present EPD.

In the model, combustion of the cork portion at end of life was combined with HDF boards, since a specific data set is not available. The applied solution follows the worst-case principle.

It was also assumed that thermal waste processing at end of life uses systems with an R1 factor (efficiency of energy conversion or energy efficiency of waste

incineration plants according to the European Waste Framework Directive) >0.6.

3.4 Cut-off criteria

Components in the decor/wear layer for which no suitable data sets are available and the mass fraction of which is clearly below 0.1% each were partially excluded.

Euro pallets to transport the resilient floor coverings were also excluded. PET strapping used to secure the packages on the pallet was also neglected due to the low apparent percentage (exact percentage not determined) of the total weight.

The sum of neglected substances is less than 5% of the material use or influence on impact categories.

3.5 Background data

The software system for holistic balancing /GaBi/ was used to model the life cycle. The entire manufacturing process as well as the energy consumption were modelled on the basis of manufacturer-specific data. However, generic background datasets were used for the upstream and downstream processes. The majority of the background datasets used were taken from the current version of the GaBi database. /Ecoinvent/ datasets were only used for substances which in any case have only a very small mass fraction and could theoretically be excluded.

The datasets contained in the databases are documented online. Where possible, German datasets were used for modules A1-3, and the corresponding European datasets for distribution transports (A4) and disposal scenarios (C modules).

3.6 Data quality

The background datasets used for accounting purposes originate from the respective updated /GaBi/ databases at the time of calculation.

The data for the examined products was captured on the basis of evaluations of internal production and environmental data, the collection of LCA-relevant data within the supply chain, as well as the evaluation of relevant data for the energy supply. The collected data were checked for plausibility and consistency. Good representativity can be assumed.

3.7 Period under review

The life cycle assessment data were collected for the 2017 observation period. Since the Modular ONE product has only been on the market since 2018, averaging was based on the share of sales in the first half of 2018.

3.8 Allocation

All required energies, raw materials, and supplies could be clearly assigned to the declared product. No by-products are produced and no allocation is required.

In module A1-A3, credits are issued for electricity and heat for the thermal recycling of production waste. Packaging materials and the product are incinerated at

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the end of life in a waste incineration plant. Any emissions that occur are taken into account in the model. Depending on their elementary composition and the resulting heating values, credits for recycling are taken into account in module D.

3.9 Comparability

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

The background database used is /GaBi/ version 8.7.

4. LCA: Scenarios and additional technical information

Transport to the construction site (A4)

Name	Value	Unit
Transport distance	713	km
Capacity utilisation (including empty runs)	50	%

Installation in the building (A5)

During installation, it can be expected that approx. 5% more material will be needed than is theoretically required to cover the surface due to cutting waste and remaining planks. However, this fact is not taken into consideration in the results of this EPD. Instead, the user can adjust the results by a corresponding factor.

Name	Value	Unit
Packaging waste	0.099	kg

Reference service life

Name	Value	Unit
Service life (according to BBSR)	20	a

End of Life (C1-C4)

Name	Value	Unit
Energy recovery	6457	kg
Transport distance truck to waste incineration plant	75	km
Truck capacity (including empty runs)	50	%

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

Name	Value	Unit
Combustible material	6.457	kg
R1 factor waste incineration plant	>60	%
Lower heating value	17	MJ/kg

The entire product is thermally utilised in a waste-to-energy plant. Module D contains credits from the energy recovery of packaging waste in module A5 and the resilient floor coverings in module C3

5. LCA: Results

The environmental impacts for 1 m² of average resilient floor coverings are shown below. The following tables show the results of the impact assessment, the use of resources, waste and other output streams in relation to the declared unit.

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	MND	MNR	MNR	MNR	MND	MND	MND	X	X	MND	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: 1 m² resilient floor coverings

Parameter	Unit	A1-A3	A4	A5	C2	C3	D
Global warming potential	[kg CO ₂ -Eq.]	-4.38E+0	3.51E-1	1.61E-1	4.28E-2	1.19E+1	-3.43E+0
Depletion potential of the stratospheric ozone layer	[kg CFC11-Eq.]	3.55E-7	1.45E-14	3.82E-15	1.78E-15	4.47E-11	-7.45E-12
Acidification potential of land and water	[kg SO ₂ -Eq.]	1.85E-2	8.53E-4	2.97E-5	1.11E-4	3.83E-3	-5.76E-3
Eutrophication potential	[kg (PO ₄) ³ -Eq.]	6.47E-3	2.15E-4	5.81E-6	2.80E-5	9.46E-4	-6.24E-4
Formation potential of tropospheric ozone photochemical oxidants	[kg ethene-Eq.]	4.43E-3	-2.90E-4	1.32E-6	-3.90E-5	2.43E-4	-4.52E-4
Abiotic depletion potential for non-fossil resources	[kg Sb-Eq.]	1.09E-5	3.10E-8	2.80E-9	3.79E-9	1.42E-7	-9.69E-7
Abiotic depletion potential for fossil resources	[MJ]	9.39E+1	4.75E+0	4.50E-2	5.82E-1	2.86E+0	-4.73E+1

RESULTS OF THE LCA - RESOURCE USE: 1 m² resilient floor coverings

Parameter	Unit	A1-A3	A4	A5	C2	C3	D
Renewable primary energy as energy carrier	[MJ]	-2.74E+0	2.49E-1	1.50E+0	3.06E-2	1.30E+2	-1.16E+1
Renewable primary energy resources as material utilization	[MJ]	1.31E+2	0.00E+0	-1.49E+0	0.00E+0	-1.29E+2	0.00E+0
Total use of renewable primary energy resources	[MJ]	1.28E+2	2.49E-1	7.22E-3	3.06E-2	4.40E-1	-1.16E+1
Non-renewable primary energy as energy carrier	[MJ]	1.04E+2	4.78E+0	5.22E-1	5.85E-1	1.12E+1	-6.01E+1
Non-renewable primary energy as material utilization	[MJ]	8.37E+0	0.00E+0	-4.70E-1	0.00E+0	-7.90E+0	0.00E+0
Total use of non-renewable primary energy resources	[MJ]	1.13E+2	4.78E+0	5.18E-2	5.85E-1	3.30E+0	-6.01E+1
Use of secondary material	[kg]	6.42E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Use of renewable secondary fuels	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Use of non-renewable secondary fuels	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Use of net fresh water	[m ³]	4.73E-1	4.59E-4	4.43E-4	5.63E-5	2.72E-2	-1.58E-2

RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES:

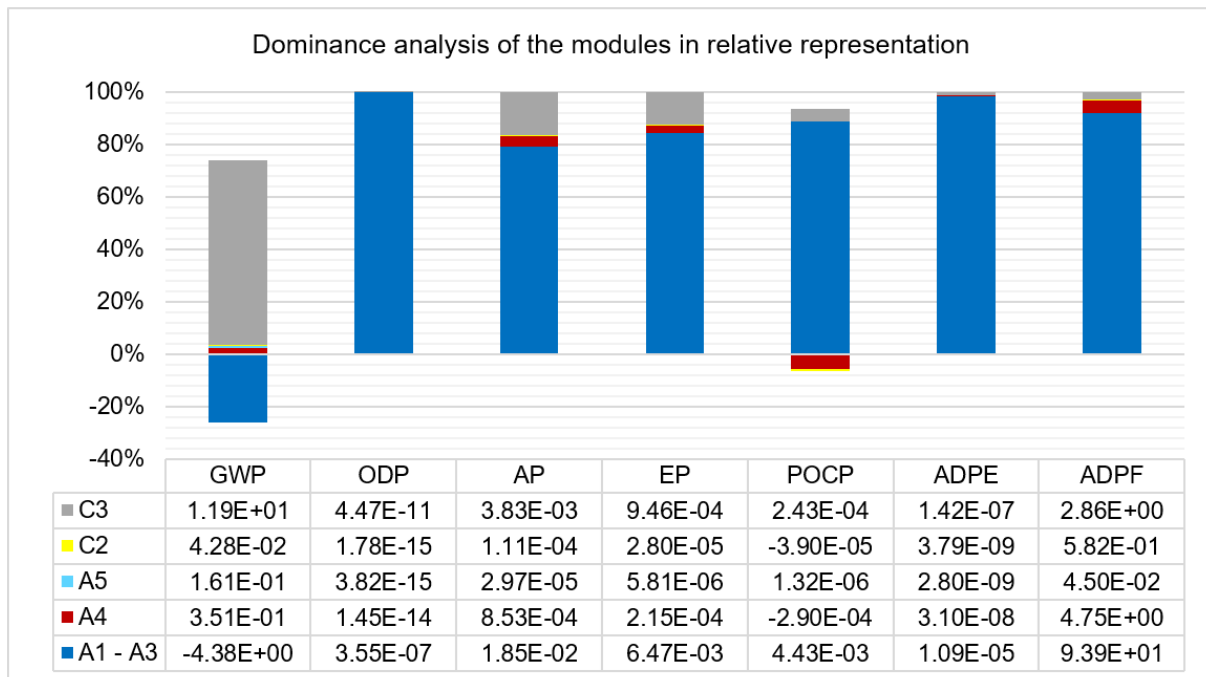
1 m² resilient floor coverings

Parameter	Unit	A1-A3	A4	A5	C2	C3	D
Hazardous waste disposed	[kg]	1.48E-6	2.52E-7	5.43E-10	3.09E-8	6.58E-8	-2.45E-8
Non-hazardous waste disposed	[kg]	6.94E-2	3.84E-4	3.16E-3	4.70E-5	4.84E-2	-2.57E-2
Radioactive waste disposed	[kg]	5.30E-3	9.98E-6	2.67E-6	1.22E-6	1.73E-4	-5.08E-3
Components for re-use	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Materials for recycling	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Materials for energy recovery	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Exported electrical energy	[MJ]	0.00E+0	0.00E+0	2.70E-1	0.00E+0	1.43E+1	0.00E+0
Exported thermal energy	[MJ]	6.60E-1	0.00E+0	4.80E-1	0.00E+0	2.60E+1	0.00E+0

Additional technical scenario information:

11.7 kg of CO₂ equivalent are bonded in one square metre of resilient floor coverings (including packaging), which in module A1-A3 creates a corresponding negative contribution.

6. LCA: Interpretation



Environmental impacts

With the exception of the GWP, all CML indicators are significantly affected by the production stage and its material and energetic upstream chains (module A1-A3). The main causes of environmental impacts lie in particular in the production processes of the HDF core board. This also accounts, by far, for the largest share of the total product in terms of mass. PVAc dispersion glue only plays a relevant role in ADPE.

In the production phase, the GWP is characterised by the biogenic carbon bound in the HDF board, which results in a credit of almost 11.7 kg CO₂ equivalent. If only the fossil GWP is considered, then the HDF board is also the greatest factor in A1-A3 at 70%. This is followed by the PUR top layer (9%), electrical power consumption (8%), and PVAc adhesive (4%).

The disposal phase (module C3) has the greatest effect on the GWP and is also relevant for the acidification potential (AP) and the eutrophication potential (EP). The cause lies almost exclusively in the thermal recycling of the HDF core board at the end of its service life. The carbon bound in the product is then released back into the atmosphere. The amount of "negative loads" of the wood in A1-A3 in the GWP does correspond to the amount of loads in C3. Thus, the balance of biogenic carbon is balanced.

The energy obtained from wood combustion is credited in a downstream system (module D; not included in the diagram), as it substitutes energy production from other sources (in this case the European electricity mix and thermal energy from natural gas).

The transports generate a small amount of credits for the POCP, which are due to a weighting of the environmental indicators according to the applied CML methodology (as of 2013). Despite the seemingly paradoxical results that more transports would lead to a reduction of total ground-level ozone, the model does not contain any errors.

Use of resources

With both renewable and non-renewable primary

energy, the impacts are to a large extent located in the production phase and there in the manufacture of the HDF core board, which is not surprising due to the large mass percentage of the board.

The use of non-renewable primary energy is attributable to the demand for thermal and electrical energy, which is covered by fossil fuels. With 75 MJ, the HDF board accounts for 66% in the manufacturing phase.

With the use of renewable primary energy, chipboard with 111 MJ has a share of 95%, which is due to the renewable raw material wood.

Fresh water is mainly used (94%) in the production phase. Here, with an impact of 93%, the PUR top layer is responsible in particular. Water consumption may be due to the agricultural cultivation of plants because it is largely produced from vegetable oils (rapeseed/ricinus).

The production of the HDF board impacts the production phase with only 5%. Cork and plastics hardly play a role.

The combustion of the product at end of life contributes 5% to the total water consumption. This is due to the necessary cooling water.

Waste

96% of the generated waste is non-hazardous waste. Approximately 60% of the waste consists of module A1-3, which also consumes the most resources for the product system. The disposal of the packaging has a share of 2% and the product end of life share is approx. 38%.

Most of the non-hazardous waste results from the production of PVAc adhesive, which is used to bond the wear layer to the core board.

Hazardous waste is generated in minute quantities and almost exclusively in module A1-A3. It also originates mainly from the upstream material chains for the production of PVAc adhesive. Radioactive waste is generated almost exclusively in the manufacture of the

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HDF core board and is most likely attributable to the nuclear energy content of the electricity mix used.

Range of results

The individual results of Modular ONE and Eco Balance PUR differ from the average results to varying degrees, depending on the impact category. In terms of one square metre, Modular ONE's GWP is 12%

lower than the average of this EPD, while Eco Balance PUR has a 77% higher GWP.

The main reason for these variations is the different decor layer. On the one hand this is because of different plastics used (PUR or PP), and on the other hand, the decor layer of Eco Balance PUR weighs around ten times as much as the one for Modular ONE.

7. Requisite evidence

The certificates valid for the product and the manufacturer are listed below.

VOC emissions

Eco Balance PUR

Testing laboratory:
eco-INSTITUT Germany GmbH
Schanzenstraße 6-20
Carlswerk 1.19
D-51063 Cologne, Germany

/Test report: 53435-004/

Test method: Emission analysis according to /EN 16516/

Results overview (3 days)		
Designation	Value	Unit
HCHO	4	µg/m³
TVOC	28	µg/m³
TSVOC	< 5	µg/m³
KMR1	< 1	µg/m³

Modular ONE

Testing laboratory:
eco-INSTITUT Germany GmbH
Schanzenstraße 6-20
Carlswerk 1.19
D-51063 Cologne, Germany

/Test report: 52545-001-003/

Test method: Emission analysis according to /EN 16516/

Results overview (3 days)		
Designation	Value	Unit
HCHO	7	µg/m³
TVOC	16	µg/m³
TSVOC	< 5	µg/m³
KMR1	< 1	µg/m³

Fire behaviour

Eco Balance PUR

Testing laboratory:
eph Dresden
Zellescher Weg 24
D-01217 Dresden, Germany

/Test report: 2715471/1/

Test method: Fire behaviour classification according to /EN 13501-1:2010/

Modular ONE

Testing authority:
TFI Aachen GmbH
Charlottenburger Allee 41
D-52068 Aachen, Germany

/Test report: 472046-03/

Test method: Fire behaviour classification according to /EN 13501-1:2010/

Certificate /RAL-UZ176 /Blue Angel

The products Eco-Balance-PUR (/Contract No. 27258/) and Modular ONE (/Contract No. 32508/) may carry the environmental label "Der Blaue Engel" (The Blue Angel) on the basis of the above-mentioned trademark usage contracts of RAL gGmbH, Fränkische Straße 7, 53229 Bonn and the Federal Environment Agency, because they are low-emission products.

Certificate /PEFC/

The certificate no. /TT-PEFC-COC180/ of 01.12.2018 confirms that the procedures for the production of the modular flooring of Parador GmbH comply with the requirements of the chain of custody according to the percentage method pursuant to the /PEFC/ standard "PEFC ST 2002:2013".

https://media.parador.eu/media/pdf/96/3c/ee/PEFC-Certifikat_BMT-PEFC-1289_PA_2017-03.pdf

8. References

Literature referenced in the Environmental Product Declaration:

/IBU 2016/

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

/ISO 14025/

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

/EN 15804/

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

PARADOR

/AltholzV/

Ordinance on requirements for the recovery and disposal of old wood.

/AVV/

Waste list directive, serves to designate and classify waste according to its need for monitoring.
<http://www.gesetze-im-internet.de/avv/index.html>

/Sustainable Building Assessment System/

BNB Code No. 352.711 Service life of components for life cycle analyses according to the Sustainable Building Assessment System, 2011: Linoleum, laminate flooring, PVC, plastic engineered wood flooring, cork, rubber, sports hall flooring.

/DIN EN 13501-1/

DIN EN 13501-1:2010-01 Classification of construction products and construction types with respect to their fire behaviour - Part 1: Classification based on results of fire behaviour tests of construction products; German version EN 13501-1:2007+A1:2009

/DIN EN 16516/

Building products - Evaluation of release of hazardous substances - Determination of indoor air emissions; German version EN 16516:2017

/DIN EN 16511/

Panels for floating installation - Semi-rigid, multi-layer, modular flooring (MMF) with abrasion resistant top layer; German version EN 16511:2014

/DIN EN 14041/

Resilient, textile, laminate, and modular multi-layer flooring - Essential characteristics; German version EN 14041:2018

/Ecoinvent/

Database on life cycle assessments (Life Cycle Inventories), Version 2.2 Swiss Centre for Life Cycle Inventories, St. Gallen, 2010.

/EMAS/

(EC) No 1221/2009 of the European Parliament and of the Council on the voluntary participation by organisations in a community system for environmental management and audit and for repealing Regulation (EC) No 761/2001 as well as the decisions of the Commission 2001/681/EC and 2006/193/EC.
<https://www.emas.de/home/>

European Chemicals Agency (/ECHA/) Candidate List of Substances of Very High Concern (SVHC) for Authorisation

<https://echa.europa.eu/de/candidate-list-table>
(accessed 27-Jun-2018; 191 substances listed)

/GaBi 8.7/

Software and database for holistic balancing, Chair of Building Physics at University of Stuttgart and thinkstep AG, Leinfelden-Echterdingen, 1992 - 2018.

/PEFC/

Programme for the Endorsement of Forest Certification Schemes

Parador Certificate No.: TT-PEFC-COC180.

/Product Category Rules for Construction

Products, Part A/:

Institut Bauen und Umwelt e.V., Königswinter (publisher): Produktkategorieregeln für Bauprodukte aus dem Programm für Umwelt-Produktdeklarationen des Instituts für Bauen und Umwelt (IBU) [product category regulations for construction products from the program for environmental product declarations of the Institute for Construction and Environment (IBU)] Part A: Rechenregeln für die Ökobilanz und Anforderungen an den Hintergrundbericht, [Algorithms for life cycle assessment and background report requirements] Version 1.7 2018-03.

/Product Category Rules 2018, Part B/:

PCR Anleitungstext für gebäudebezogene Produkte und Dienstleistungen der Bauproduktgruppe Bodenbeläge [PCR instruction text for building-related products and services of the building product group flooring], Version 1.2 2018-02.

/Test report: 53435-004/

Emission analysis of Eco Balance PUR according to /EN 16516/

/Test report: 52545-001-003/

Emissions analysis from Modular ONE according to /EN 16516/

/Test report: 2715471/1/

Classification of Eco Balance PUR for fire behaviour according to /EN 13501-1:2010/

/Test report: 472046-03/

Test procedure: Classification of Modular ONE for fire behaviour according to /EN 13501-1:2010/

/RAL-UZ 176/

Low-emission flooring, panels and doors made of wood and wood-based products for interiors. Eco Balance PUR Contract No.: 27258
Modular ONE Contract No.: 32508
<https://produktinfo.blauer-engel.de/uploads/criteriafile/de/DE-UZ%20176-201708-de%20Kriterien.pdf>

/Regulation (EU) No 305/2011/

of the European Parliament and of the Council of 9 March 2011 specifying harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC text with EEA relevance.
<https://eur-lex.europa.eu/legal-content/DE/TXT/PDF/?uri=CELEX:32011R0305&from=DE>

/Regulation (EU) No 528/2012/

of the European Parliament and of the Council of 22 May 2012 on the availability on the market and use of biocide products text with EEA relevance

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