

ENVIRONMENTAL PRODUCT DECLARATION

according to ISO 14025 and EN 15804+A2

Declaration holder	Parador GmbH
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Program administrator	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-PAR-20210151-IBC1-DE
Date of issue	04.03.2022
Valid until	03.03.2027

Modular ONE design flooring
Parador GmbH

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1. General information

Parador GmbH <hr/> Programme administrator IBU - Institut Bauen und Umwelt e.V. Panoramastr. 1 10178 Berlin Germany	Modular ONE design flooring <hr/> Declaration holder Parador GmbH Millenkamp 7-8 D-48653 Coesfeld, Germany
Declaration number EPD-PAR-20210151-IBC1-DE	Declared product/declared unit The declared unit is one square metre (1 m ²) of Modular ONE design flooring.
This declaration is based on the product category rules: Floor coverings, 02/2018 (PCR tested and approved by the Independent Council of Experts (SVR))	Scope of validity: This EPD relates to the manufacture, transport, installation and disposal of an average square metre of Parador Modular ONE design flooring. The technical characteristics are described in chapter 2.3. The product is manufactured in Coesfeld, Germany.
Date of issue 04.03.2022	The declaration holder is liable for the underlying information and evidence; the IBU is not liable for manufacturer information, ecological assessment data, and verification. The EPD was drawn up in accordance with the specifications of EN 15804+A2. In the following, the standard is referred to as EN 15804 for simplification purposes.
Valid until 03.03.2027	Verification The European Standard <i>EN 15804</i> serves as the core PCR Independent verification of the declaration and information according to <i>ISO 14025:2010</i> <input type="checkbox"/> internal <input checked="" type="checkbox"/> external
[Signature] <hr/> Dipl. Ing. Hans Peters (Chairman of the Board of the Institut Bauen und Umwelt e.V.) [Signature]	[Signature] <hr/> Angela Schindler, Independent Verifier
Dr. Alexander Röder (Managing Director of the Institut Bauen und Umwelt e.V.)	

2. Product

2.1 Description of the company

Parador GmbH is a German manufacturer of flooring and wall design products based in Coesfeld (North Rhine-Westphalia). Founded in 1977, the company produces laminate flooring, engineered wood flooring and resilient floor coverings as well as decorative panels for walls and ceilings. It currently employs 550 people. Production sites are Coesfeld and Güssing in Austria.

2.2 Product description/product definition

The multi-layered structure of the Modular ONE flooring is characterised by the coating of decor paper with the material polypropylene (PP). 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 Modular ONE flooring is a high-density fibreboard (HDF) suitable for use in wet rooms, which gives the flooring flexible strength and, thanks to a special coating, guarantees that the flooring is waterproof for up to 4 hours in standing water.

Regulation (EU) No. 305/2011 (Construction Products

Regulation) applies to 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 14041:2004/AC:2006, Resilient, textile, laminate and modular multi-layer floor coverings – Essential characteristics*; and the CE marking. The respective national regulations apply to the use.

2.3 Application:

Design floorings are suitable for private and commercial use indoors. They are either installed 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 can be found in the enclosed installation instructions or in the "Guide Design flooring Vinyl flooring and Modular ONE".

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2.4 Technical data

Structural data

Designation	Value	Unit
Element thickness	8	mm
Wear class	23/33	
Length of top layer	according to current type list	mm
Width of top layer	according to current type list	mm
Surface weight	6320	g/m ²
Manufacturing method	Lamination	-

Further technical information can be found at:
https://parador.de/pcms/downloads/downloadfile/file_id/231/

Certificates can be found at:
<https://parador.de/services/downloads/elastische-bodenbelaege> and there under the heading Certificates

Performance values of the product as stated in the declaration of performance in relation to its essential characteristics according to *EN 14041:2004/AC:2006 Resilient, textile, laminate and modular multi-layer floor coverings - Essential characteristics*.

You will find the declarations of performance at:
https://parador.de/pcms/downloads/downloadfile/file_id/391/

2.5 Delivery condition

The Modular ONE floors are delivered in the following condition:

Format	
Length	853-2200 mm
Width	194-400 mm
Height	8 mm

2.6 Raw materials/auxiliary materials

The averaged percentage of ingredients per m² in mass per cent for the EPD is as follows:

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

The product/at least one part of the product contains substances on the candidate list(*ECHA*) (date 08.07.2021) above 0.1 % by mass: no.

The product/at least one part of the product contains other CMR substances of category 1A or 1B not on the candidate list(*ECHA*) above 0.1 % by mass in at least one part of the product: no.

No biocide products have been added to the present construction product nor has it been treated with biocide products (it is therefore an untreated product within the meaning of the Biocide Products Regulation

(*Regulation (EU) No 528/2012*): yes.

2.7 Manufacture

The HDF core board, the wear layer and the cork backing are pressed together using a glue / PUR adhesive.

The planks are then formatted and given a longitudinal and transverse profile. After quality control of the individual flooring elements, they are packed in half-shell cartons and shrink-wrapped in polyethylene (PE). 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 inspected and documented as part of the in-house Factory Production Control (FPC).

2.8 Environment and health during production

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.

2.9 Product processing/installation

For the installation of this 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 "Guide Design flooring Vinyl flooring and Modular ONE" (https://parador.de/pcms/downloads/downloadfile/file_id/100/).

2.10 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.

2.11 Use status

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

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should be at a temperature of approx. 20°C and a relative humidity of between 35 and 60 % all year round.

2.12 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 *DE-UZ176* (Blue Angel) "Contract 32508".

2.13 Reference useful life

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

2.14 Exceptional effects

Fire

In the area of fire protection, the following building material class according to *EN 13501-1* is complied with:

Fire protection

Designation	Value
Building material class	Cfl
Flaming droplets	N.r.
Flue gas development	s1

N.r.: not relevant for floor coverings

Water

An edge swell protection exists against short-term exposure to water. This resilient floor covering is 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.

2.15 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 floor covering 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.

2.16 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.

2.17 Additional 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 Modular ONE design flooring. Packaging materials.

Declared unit

Designation	Value	Unit
Declared unit	1	m ²
Packaging materials	0.095	kg/m ²
Layer thickness	0.008	m
Total	6.317	kg/m ²
Conversion factor to 1 kg	6.221	kg/m ²
Surface weight	6.221	kg/m ²

3.2 System boundary

Type of EPD: Cradle to factory gate with options.

Modules A1-A3, A4 and A5

The product stage (A1-A3) 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 C1-C4

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 C1 is cut off because the Modular ONE design flooring can be dismantled by hand and no power-operated tools are required.

Module C4 does not contain any values because all the floor covering can be reused in another form and is not put into landfill.

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

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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 Truncation rules

Components in the decor/wear layer for which no matching data sets are available and whose mass fraction is significantly less than 0.1 % in each case, were partially truncated. Euro pallets for transporting the flooring were truncated. 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 truncated.

The datasets contained in the databases are documented online. Where possible, German datasets were used for modules A1-A3, and the corresponding European datasets for distribution transports (A4) and disposal scenarios (C modules).

3.6 Data quality

The background datasets used for balancing 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 consideration

The average calculation was based on the sales volume share 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. Packaging materials and the product are incinerated at 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

A comparison or evaluation of EPD data is generally possible only if all datasets to be compared have been created in accordance with *EN 15804* and the building context or product-specific performance characteristics have been taken into account.

The background database used is *GaBi* version 10.5, content version 2021.2.

4. LCA: Scenarios and additional technical information

Characteristic product properties, biogenic carbon

Information describing the biogenic carbon content at the factory gate

Designation	Value	Unit
Biogenic carbon in the product	2.43	kg C
Biogenic carbon in the associated packaging	0.03	kg C

Transport to construction site (A4)

Designation	Value	Unit
Transport distance	713	km
Capacity (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.

Designation	Value	Unit
Packaging waste	0.0954	kg

The Sustainable Building Assessment System (*BNB*) assumes a useful life of 20 years for modular flooring under code no. 352.711.

Reference useful life

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

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End of life (C1 - C4)

Designation	Value	Unit
For energy recovery waste type	6.22	kg
Transport distance truck to waste incineration plant	75	km
Truck capacity (including empty runs)	50	%

Reuse, recovery and recycling potential (D), relevant scenario data

Designation	Value	Unit
Combustible material	6.22	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 Modular ONE design flooring 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.

Important information:

EP-freshwater: This indicator was calculated as "kg P-eq." in accordance with the characterisation model (EUTREND model, Struijs et al., 2009b, as implemented in ReCiPe;

<http://epica.jrc.ec.europa.eu/LCDN/developerEF.xhtml>).

INDICATION OF SYSTEM BOUNDARIES (X = INCLUDED IN LIFE CYCLE ASSESSMENT; ND = MODULE OR INDICATOR NOT DECLARED; MNR = MODULE NOT RELEVANT)

Production stage			Stage of construction of the structure		Utilisation stage							Disposal stage				Credits and debits outside the system boundary
Raw material supply	Transport	Manufacture	Transport from manufacturer to place of use	Assembly	Use/Application	Maintenance	Repair	Replacement	Renewal	Energy input for the operation of the building	Use of water for the operation of the building	Dismantling / demolition	Transport	Waste management	Removal	Reuse, recovery, or recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	ND	ND	MNR	MNR	MNR	ND	ND	X	X	X	X	X

RESULTS OF THE LIFE CYCLE ASSESSMENT – ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 m² of Modular ONE design flooring

Core indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP total	[kg CO ₂ equivalent]	-4.40E+0	3.48E-1	1.64E-1	0.00E+0	4.26E-2	9.78E+0	0.00E+0	-3.16E+0
GWP fossil	[kg CO ₂ equivalent]	4.62E+0	3.46E-1	3.70E-2	0.00E+0	4.22E-2	8.83E-1	0.00E+0	-3.15E+0
GWP biogenic	[kg CO ₂ equivalent]	-9.03E+0	0.00E+0	1.27E-1	0.00E+0	0.00E+0	8.90E+0	0.00E+0	3.49E-6
GWP luluc	[kg CO ₂ equivalent]	8.65E-3	2.81E-3	5.49E-6	0.00E+0	3.45E-4	1.35E-4	0.00E+0	-2.17E-3
ODP	[kg CFC11 equivalent]	6.75E-10	6.80E-17	2.85E-18	0.00E+0	8.33E-18	3.88E-11	0.00E+0	-3.59E-14
AP	[mol H ⁺ eq.]	1.54E-2	1.16E-3	5.95E-6	0.00E+0	1.51E-4	5.27E-3	0.00E+0	-4.11E-3
EP freshwater	[kg PO ₄ -eq.]	3.09E-5	1.02E-6	2.29E-9	0.00E+0	1.25E-7	2.64E-7	0.00E+0	-4.11E-6
EP marine	[kg N-eq.]	6.80E-3	5.32E-4	1.84E-6	0.00E+0	7.02E-5	2.47E-3	0.00E+0	-1.17E-3
EP terrestrial	[mol N-eq.]	5.72E-2	5.93E-3	2.90E-5	0.00E+0	7.83E-4	2.88E-2	0.00E+0	-1.25E-2
POCP	[kg NMVOC eq.]	1.43E-2	1.04E-3	4.36E-6	0.00E+0	1.37E-4	6.36E-3	0.00E+0	-3.29E-3
ADPE	[kg Sb equivalent]	3.19E-6	3.05E-8	9.85E-11	0.00E+0	3.74E-9	2.92E-8	0.00E+0	-5.23E-7
ADPF	[MJ]	9.85E+1	4.58E+0	1.31E-2	0.00E+0	5.62E-1	3.30E+0	0.00E+0	-5.47E+1
WDP	[m ³ world equivalent withdrawn]	4.24E+0	3.19E-3	3.35E-3	0.00E+0	3.92E-4	1.10E+0	0.00E+0	-2.41E-1

Key: GWP = Global Warming Potential; ODP = Ozone Depletion Potential; AP = Soil and Water Acidification Potential; EP = Eutrophication Potential; POCP = Tropospheric Ozone Creation Potential; ADPE = Abiotic Resource Depletion Potential – non-fossil resources; ADPF = Abiotic Resource Depletion Potential - fossil fuels (ADP - fossil energy sources); WDP = water depletion potential (users).

RESULTS OF THE LIFE CYCLE ASSESSMENT – INDICATORS FOR THE DESCRIPTION OF RESOURCE INPUT according to EN 15804+A2: 1 m² of Modular ONE design flooring

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	[MJ]	2.18E+1	2.64E-1	1.43E+0	0.00E+0	3.23E-2	1.20E+2	0.00E+0	-1.23E+1
PERM	[MJ]	1.21E+2	0.00E+0	-1.42E+0	0.00E+0	0.00E+0	-1.19E+2	0.00E+0	0.00E+0
PERT	[MJ]	1.43E+2	2.64E-1	1.37E-3	0.00E+0	3.23E-2	5.40E-1	0.00E+0	-1.23E+1
PENRE	[MJ]	8.80E+1	4.60E+0	4.78E-1	0.00E+0	5.64E-1	1.33E+1	0.00E+0	-5.47E+1
PENRM	[MJ]	1.05E+1	0.00E+0	-4.65E-1	0.00E+0	0.00E+0	-1.00E+1	0.00E+0	0.00E+0
PENRT	[MJ]	9.85E+1	4.60E+0	1.31E-2	0.00E+0	5.64E-1	3.31E+0	0.00E+0	-5.47E+1
SM	[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
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
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
FW	[m ³]	1.15E-1	3.02E-4	7.90E-5	0.00E+0	3.70E-5	2.60E-2	0.00E+0	-1.20E-2

Key: PERE = Renewable primary energy as energy carrier; PERM = Renewable primary energy for material use; PERT = Total renewable primary energy; PENRE = Non-renewable primary energy as energy carrier; PENRM = Non-renewable primary energy for material use; PENRT = Total non-renewable primary energy; SM = Use of secondary materials; RSF = Renewable secondary fuels; NRSF = Non-renewable secondary fuels; FW = Net input of freshwater resources

RESULTS OF THE LIFE CYCLE ASSESSMENT – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1 m² of Modular ONE design flooring

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Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
HWD	[kg]	8.54E-8	2.42E-10	1.25E-12	0.00E+0	2.97E-11	6.85E-10	0.00E+0	-1.23E-8
NHWD	[kg]	1.24E-1	7.22E-4	1.45E-4	0.00E+0	8.85E-5	1.04E-1	0.00E+0	-2.56E-2
RWD	[kg]	3.37E-3	8.35E-6	2.68E-7	0.00E+0	1.02E-6	1.41E-4	0.00E+0	-3.97E-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
MFR	[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
MER	[kg]	2.82E-1	0.00E+0	1.16E-2	0.00E+0	0.00E+0	6.12E+0	0.00E+0	0.00E+0
EEE	[MJ]	0.00E+0	0.00E+0	7.75E-2	0.00E+0	0.00E+0	1.34E+1	0.00E+0	0.00E+0
EET	[MJ]	0.00E+0	0.00E+0	1.38E-1	0.00E+0	0.00E+0	2.45E+1	0.00E+0	0.00E+0

Key HWD = Hazardous Waste to Landfill; NHWD = Disposed Non-Hazardous Waste; RWD = Disposed Radioactive Waste; CRU = Components for Reuse; MFR = Materials for Recycling; MER = Materials for Energy Recovery; EEE = Exported Energy – electrical; EET = Exported Energy – thermal.

RESULTS OF THE LIFE CYCLE ASSESSMENT – additional impact categories according to EN 15804+A2-optional: 1 m² of Modular ONE design flooring

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PM	[Illness cases]	ND	ND	ND	ND	ND	ND	ND	ND
IR	[kBq U235- eq.]	ND	ND	ND	ND	ND	ND	ND	ND
ETP-fw	[CTUe]	ND	ND	ND	ND	ND	ND	ND	ND
HTP-c	[CTUh]	ND	ND	ND	ND	ND	ND	ND	ND
HTP-nc	[CTUh]	ND	ND	ND	ND	ND	ND	ND	ND
SQP	[-]	ND	ND	ND	ND	ND	ND	ND	ND

Key PM = Potential incidence of illnesses due to particulate matter emissions; IR = Potential effect from human exposure to U235; ETP-fw = Potential toxicity comparison unit for ecosystems; HTP-c = Potential toxicity comparison unit for humans (carcinogenic effect); HTP-nc = Potential toxicity comparison unit for humans (non-carcinogenic effect) SQP = Potential Soil Quality Index

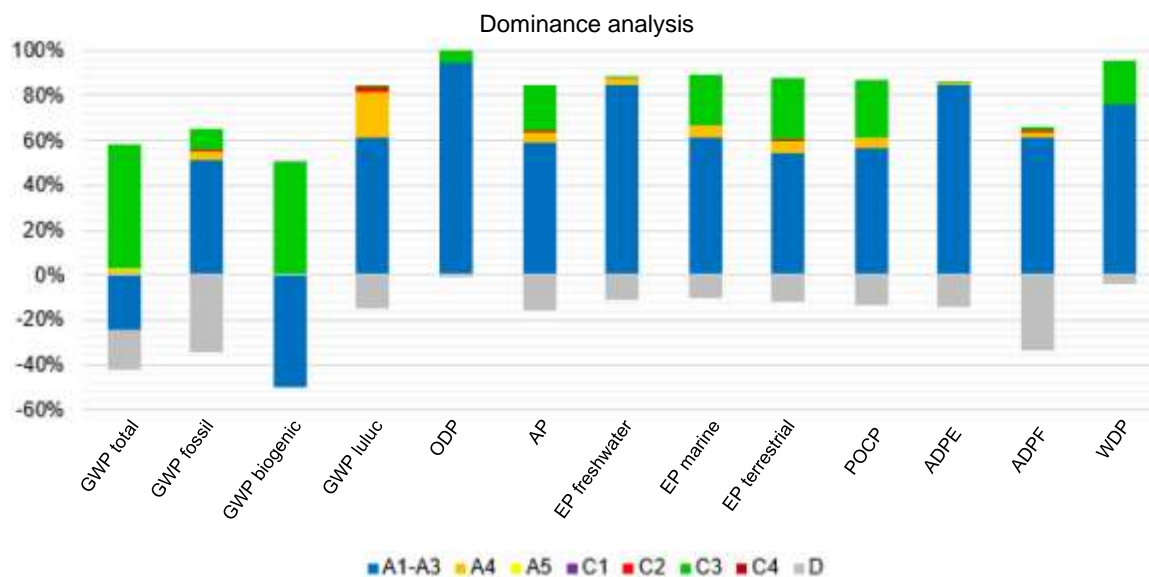
The designation of the additional indicators according to EN 15804+A2 is optional. The indicators are not shown in the EPD ("ND").

Limitation note 1 – applies to indicator IRP

This impact category mainly deals with the possible effect of low-dose ionising radiation on human health in the nuclear fuel cycle. It does not take into account effects due to possible nuclear accidents and occupational exposure, nor does it consider the disposal of radioactive waste in underground facilities. The potential ionising radiation emitted by soil, radon and some building materials is also not measured by this indicator.

Limitation note 2 – applies to indicators ADPE, ADPF, WDP, ETP-fw, HTP-c, HTP-nc, SQP The results of this environmental impact indicator must be used with caution, as the uncertainties in these results are high or as there is limited experience with the indicator.

6. LCA: Interpretation



Environmental impacts

The dominance analysis shows that the manufacturing phase (modules A1-A3) is dominant in most impact categories over the life cycle of the floor covering. The

indicators Global Warming Potential total (GWP-total) and Global Warming Potential biogenic (GWP-biogenic) are an exception. Here, the disposal of the floor covering (module C3) accounts for the largest

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share of emissions. This is due to the fact that, in case of the assumed thermal recycling of the floor covering, the biogenic carbon stored in the product is emitted as biogenic CO₂ emissions. This is also the reason why the sum of biogenic CO₂ emissions is balanced over the life cycle of the product.

In the manufacturing phase (modules A1-A3), the dataset used for the HDF board contributes the largest share to the potential environmental impacts in most of the categories considered. This is due to the high mass proportion of HDF board in the product. Thus, the HDF board contributes to 69 % of the fossil CO₂ emissions (GWP-fossil) in modules A1-A3. The electrical energy used has a share of 11 %, the glue (PVAc adhesive) a

share of 8 %, the polypropylene a share of 7 % of the GWP-fossil.

The stratospheric ozone depletion potential (ODP) indicator is an exception. Here, the data sets for the zinc oxide with 65 % and the data set for nickel contribute 30 % to the potential environmental impacts.

Primary energy

For both renewable and non-renewable primary energy (PERT and PENRT, respectively), the influences are largely in the manufacturing phase and there in the production of the HDF core board.

7. Verifications

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

VOC emissions

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

Test report: 5655-001

Test method: Emission analysis according to EN 16516

Results overview (3 days):		
Designation	Value	Unit
HCHO	4	µg/m ³
TVOC	51	µg/m ³
TSVOC	<5	µg/m ³
KMR1	< 1	µg/m ³

Fire behaviour

Testing laboratory:
TFI Aachen GmbH
Charlottenburger Allee 41
D-52068 Aachen

Test report: 472046-03

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

Certificate DE-UZ176 Blue Angel

Modular ONE (contract no. 32508) is allowed to use 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://parador.de/pcms/downloads/downloadfile/file_id/670/

8. Literature references

Standards

EN 13501-1

DIN EN 13501-1:2019-05, Classification of construction products and types of construction as to their reaction to fire - Part 1: Classification using the results of tests on the reaction to fire performance of construction products.

EN 14041

DIN EN 14041:2004/AC:2006, Resilient, textile, laminate and modular multi-layer floor coverings - Essential characteristics.

EN 15804

DIN EN 15804:2020-03, Sustainability of buildings - Environmental product declarations - Basic rules for

the product category construction products.

EN 16516

DIN EN 16516:2020-10, Construction products: Assessment of release of hazardous substances - Determination of emissions to indoor air.

ISO 14025

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

Further literature

AltholzV

Ordinance on requirements for the recovery and disposal of old wood (Waste Wood Ordinance),

PARADOR

15.08.2002.

AVV

Waste Catalogue Ordinance (AVV) of 10 December 2001 (BGBl. I p. 3379), which was last amended by Article 1 of the Ordinance of 30 June 2020 (BGBl. I p. 3005).

BNB

BNB Code No. 352.711 Useful lives of building components for life cycle analyses according to the Sustainable Building Assessment System, 2011: Linoleum, laminate, PVC, plastic engineered wood flooring, cork, rubber, sports hall coverings. Berlin: Federal Ministry of the Interior, for Building and Home Affairs.

DE-UZ 176

"Blue Angel" eco-label for low-emission floor coverings, panels and doors made of wood and wood-based materials for interiors.

Modular ONE Contract No.: 32508; Bonn: RAL gGmbH, Dessau-Rosslau: Federal Environment Agency, 23.07.2020. https://parador.de/pcms/downloads/downloadfile/file_id/951/

ECHA

List of Candidate Substances of Very High Concern (ECHA Candidate List), dated 19.01.2021, published in accordance with Article 59(10) of the REACH Regulation. Helsinki: European Chemicals Agency.

ecoinvent 3.6

ecoinvent 3.6 Database on Life Cycle Assessment Inventories (Life Cycle Inventory data). Zurich: ecoinvent Association, 2020.

EMAS

Regulation (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/>

GaBi 10.5

GaBi 10.5: Software System and Database for Life Cycle Engineering, Sphera Solutions GmbH, Leinfelden-Echterdingen, 2021.

IBU 2021

Institut Bauen und Umwelt e.V.: General guide for the EPD programme of the Institut Bauen und Umwelt e.V., Version 2.0, Berlin: Institut Bauen und Umwelt e.V., 2021 www.ibu-epd.com

PCR Part A

Product category rules for building-related products and services. Part A: Calculation rules for LCA and requirements for the project report according to EN 15804+A2:2019, Version 1.2 Berlin: Institut Bauen und Umwelt e.V.. (publ.), 2021.

PCR: Floor coverings

Product category rules for building-related products and services. Part B: Environmental Product Declaration requirements for floor coverings, Version 1.2. Berlin: Institut Bauen und Umwelt e.V.. (publ.), 14.02.2018.

PEFC

Programme for the Endorsement of Forest Certification Schemes. PEFC ST 2002:2013 - Production and distribution of laminate, resilient flooring, parquet, ceilings and other wood products; Parador certificate no.: TT-PEFC-COC180; Riga: BM TRADA Latvia Ltd. on behalf of BM TRADA Deutschland GmbH, 1.12.2018.

Test report: 5655-001

Emission analysis of Modular ONE according to EN 16516. Cologne: eco-INITIUT Germany GmbH, 24.08.2021.

Test report: 472046-03

Test method: Classification of Modular ONE for reaction to fire according to EN 13501-1:2010. Aachen: TFI Aachen GmbH, 07.03.2018.

Regulation (EU) No. 305/2011

Regulation (EU) No. 305/2011 of the European Parliament and of the Council of 9 March 2011 laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC.

<https://eur-lex.europa.eu/legal-content/DE/TXT/PDF/?uri=CELEX:32011R0305&from=DE>

Regulation (EU) No. 528/2012

Regulation (EU) No. 528/2012 of the European Parliament and of the Council of 22 May 2012 concerning the availability on the market and use of biocide products.

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