



SHI PRODUCT PASSPORT

Find products. Certify buildings.

SHI Product Passport No.:

1782-10-1010

Modular ONE Hydron

Product group: Design floors

PARADOR

Parador GmbH
Millenkamp 7 – 8
48653 Coesfeld



Product qualities:



Köttner
Helmut Köttner
Scientific Director
Freiburg, 02 February 2026



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SHI Product Assessment 2024

Since 2008, Sentinel Holding Institut GmbH (SHI) has been establishing a unique standard for products that support healthy indoor air. Experts carry out independent product assessments based on clear and transparent criteria. In addition, the independent testing company SGS regularly audits the processes and data accuracy.

Criteria	Product category	Harmful substance limit	Assessment
SHI Product Assessment	Other floor coverings	TVOC ≤ 160 µg/m ³ Formaldehyd ≤ 10 µg/m ³	Indoor Air Quality Certified

Valid until: 21 August 2027



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QNG - Qualitätssiegel Nachhaltiges Gebäude

The Qualitätssiegel Nachhaltiges Gebäude (Quality Seal for Sustainable Buildings), developed by the German Federal Ministry for Housing, Urban Development and Building (BMWSB), defines requirements for the ecological, socio-cultural, and economic quality of buildings. The Sentinel Holding Institut evaluates construction products in accordance with QNG requirements for certification and awards the QNG ready label. Compliance with the QNG standard is a prerequisite for eligibility for the KfW funding programme. For certain product groups, the QNG currently has no specific requirements defined. Although classified as not assessment-relevant, these products remain suitable for QNG-certified projects.

Criteria	Pos. / product group	Considered substances	QNG assessment
3.1.3 Schadstoffvermeidung in Baumaterialien	2.2 Resilient floor coverings – including multilayer systems	VOC / Emissions / hazardous substances / polycyclic aromatic hydrocarbons (PAH) / SVHC / heavy metals	QNG ready

Verification: Blauer Engel zertifiziert



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DGNB New Construction 2023

The DGNB System (German Sustainable Building Council) assesses the sustainability of various types of buildings. It can be applied to both large-scale private and commercial projects as well as smaller residential buildings. The 2023 version sets high standards for ecological, economic, socio-cultural, and functional aspects throughout the entire life cycle of a building.

Criteria	No. / Relevant building components / construction materials / surfaces	Considered substances / aspects	Quality level
ENV 1.2 Local environmental impact, 03.05.2024 (3rd edition)	7 Floor coverings (Resilient floor coverings)	VVOCs, VOC, SVOC emissions and content of hazardous substances	Quality level 4

Verification: Blauer Engel Zertifikat vom 30.06.2021

Criteria	No. / Relevant building components / construction materials / surfaces	Considered substances / aspects	Quality level
ENV 1.2 Local environmental impact, 29.05.2025 (4th edition)	7 Floor coverings for indoor use (elastic floor coverings)	VVOCs, VOC, SVOC emissions and content of hazardous substances	Quality level 4

Verification: Blauer Engel Zertifikat vom 30.06.2021



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DGNB New Construction 2018

The DGNB System (German Sustainable Building Council) assesses the sustainability of various types of buildings. It can be applied to both large-scale private and commercial projects as well as smaller residential buildings.

Criteria	No. / Relevant building components / construction materials / surfaces	Considered substances / aspects	Quality level
ENV 1.2 Local environmental impact	7 Floor coverings (Resilient floor coverings)	VOC / SVOC / hazardous substances	Quality level 4

Verification: Blauer Engel Zertifikat vom 30.06.2021

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BNB-BN Neubau V2015

The Bewertungssystem Nachhaltiges Bauen (Assessment System for Sustainable Building) is a tool for evaluating public office and administrative buildings, educational facilities, laboratory buildings, and outdoor areas in Germany. The BNB was developed by the former Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) and is now overseen by the Federal Ministry for Housing, Urban Development and Building (BMWSB).

Criteria	Pos. / product type	Considered substance group	Quality level
1.1.6 Risiken für die lokale Umwelt	2a Elastic floor coverings – with and without bonded underlay or insulation layer	VOC / hazardous substances / heavy metals	Quality level 5

Verification: Blauer Engel zertifiziert



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EU taxonomy

The EU Taxonomy classifies economic activities and products according to their environmental impact. At the product level, the EU regulation defines clear requirements for harmful substances, formaldehyde and volatile organic compounds (VOCs). The Sentinel Holding Institut GmbH labels qualified products that meet this standard.

Criteria	Product type	Considered substances	Assessment
DNSH - Pollution prevention and control	Floor coverings (including associated adhesives and sealants)	Substances according to Annex C, formaldehyde, carcinogenic VOCs category 1A/1B	EU taxonomy compliant

Verification: Blauer Engel zertifiziert



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BREEAM DE Neubau 2018

BREEAM (Building Research Establishment Environmental Assessment Methodology) is a UK-based building assessment system that evaluates the sustainability of new constructions, refurbishments, and conversions. Developed by the Building Research Establishment (BRE), the system aims to assess and improve the environmental, economic, and social performance of buildings.

Criteria	Product category	Considered substances	Quality level
Hea 02 Indoor Air Quality	Flooring materials (including floor levelling compounds and resin flooring)	Emissions: Formaldehyde, TVOC, carcinogens	Normal quality

Verification: Blauer Engel Zertifikat vom 30.06.2021



Product:

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Product labels

In the construction industry, high-quality materials are crucial for a building's indoor air quality and sustainability. Product labels and certificates offer guidance to meet these requirements. However, the evaluation criteria of these labels vary, and it is important to carefully assess them to ensure products align with the specific needs of a construction project.



The *Blue Angel* ("Blauer Engel") ecolabel, awarded by the German Federal Environment Agency, is one of the oldest and most widely used ecolabels in Germany. It exists in several variants for many different product groups. Since the test criteria, such as threshold values, differ between these variants, it is important to consider each one individually when assessing indoor air quality.



The IBU ("Institut Bauen und Umwelt e.V.") is an initiative of building product manufacturers committed to sustainability in construction. It serves as the programme operator for Environmental Product Declarations (EPDs) in accordance with the EN 15804 standard. The IBU EPD programme provides comprehensive life cycle assessments and environmental impact data for construction products, supported by independent third-party verification.



Products bearing the Sentinel Holding Institute QNG-ready seal are suitable for projects aiming to achieve the "Qualitätssiegel Nachhaltiges Gebäude" (Quality Seal for Sustainable Buildings). QNG-ready products meet the requirements of QNG Appendix Document 3.1.3, "Avoidance of Harmful Substances in Building Materials." The KfW loan program Climate-Friendly New Construction with QNG may allow for additional funding.



This product is SHI Indoor Air Quality certified and recommended by Sentinel Holding Institut. Indoor-air-focused construction, renovation, and operation of buildings is made possible by transparent and verifiable criteria thanks to the Sentinel Holding concept.

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Legal notices

(*) These criteria apply to the construction project as a whole. While individual products can positively contribute to the overall building score through proper planning, the evaluation is always conducted at the building level. The information was provided entirely by the manufacturer.

Find our criteria here: <https://www.sentinel-holding.eu/de/Themenwelten/Pr%C3%BCfkriterien%20f%C3%BCr%20Produkte>

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Publisher

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Produkteigenschaften

Format		856 x 403 x 5,5 mm	1290 x 196 x 5,5 mm
Verpackung	Paket:	8 Elemente / 2,76 m ² / 19,44 kg	8 Elemente / 2,023 m ² / 14,34 kg
	Palette:	30 Pakete / 82,792 m ² / 598,14 kg	48 Pakete / 97,091 m ² / 703,42 kg

Toleranzen (Anforderung EN 16511:2023)

Rechtwinkligkeit des Elementes (≤ 0,20mm)	≤ 0,15 mm
Bestimmung der Kantengeradheit (≤ 0,30 mm/m)	≤ 0,20 mm/m
Ebenheit konkav/konvex	längs (≤ 0,50 / ≤ 1,0 %)
	breit (≤ 0,15 / ≤ 0,20 %)
Höhendifferenz	(mittel ≤ 0,10 mm)
	(max. ≤ 0,15 mm)
Fugenöffnung	(mittel ≤ 0,15 mm)
	(max. ≤ 0,20 mm)

Garantieleistung (laut Parador Garantiebestimmungen)		Hinweise
Privater Bereich	Gewöhnlicher Bereich	- geeignet für vollflächige Verklebung
Lifetime	10 Jahre	- Reinigung und Pflege siehe Anleitung - Technische Änderungen vorbehalten
	www.blauer-engel.de/z120	
		Qualität Fertigung überwacht Funktionalität www.tuv.com ID: 0000057519
		ISO 14025 and EN 15804 Institut Bauen und Umwelt e.V.

Klassifizierung

Nutzungsklasse 23 = privater Wohnbereich mit intensiver Nutzung		
Nutzungsklasse 33 = gewerblicher Bereich mit intensiver Nutzung		
Der Designboden erfüllt alle Eigenschaften der ausgewiesenen Nutzungsklasse.		
Anforderungen / Eigenschaften	Prüfnorm	Bewertung
	EN 13501-1	C _n s1
	EN 13893 EN 14041	μ ≥ 0,30 DS
	EN 438-2	Gruppe 1+2: Grad 5, keine sichtbare Veränderung Gruppe 3: Grad 4, leichte Veränderung
	EN ISO 105 – B02 Verfahren 3	Wollblauskala: Stufe ≥ 6
	EN ISO 4918	Typ W, keine sichtbaren Veränderungen
	EN 12667	0,033 m ² *K/W
	EN ISO 16581	kein sichtbarer Schaden (Stempel Typ 0)
	EN ISO 24343-1	≤ 0,05 mm
	EN ISO 10140-3	17 dB
	ISO 24334	Längs ≥ 1 KN/m Quer ≥ 1,5 KN/m
	ISO 24338, Verfahren B	> 7.000 Umdrehungen
	EN 13329 Anhang F	≥ 1.800 mm
	EN ISO 23999	≤ 0,10 %
	EN ISO 23999	≤ 2mm
	EN 317	wasserfest
Mikrokratzbeständigkeit	EN 16094	Verfahren A MSR-A2 Für matte Oberflächen (Glanz ≤ 7): ≤ 1,5 Einheitenänderung bei 60°
Rutschhemmung	EN 16165, Anh. B Schiefe Ebene	R10
	EN 16165, Anh. C Pendelprüfung	PTV (trocken (Gleiter 96)) ≥ 36 Low slip potential gem. UK Slip resistance group
Entsorgung	EAK-Schlüssel (Europäischer Abfallkatalog)	17 02 03

Änderung durch:	QMB Parador	Datename:	PA_TDS_Modular-ONE_Hydron_DE_20250101
Datum:	01.05.2021	Aktuellste Version unter:	https://parador.de/services/downloads/designboden

Unsere TDS werden laufend aktualisiert und dem Stand der Technik angepasst. Diese Version ersetzt alle früheren Ausgaben und ist gültig ab:

01.01.2025

URKUNDE

PARADOR GmbH
48653 Coesfeld, Deutschland

wird aufgrund des Zeichenbenutzungsvertrages Nr. 36424 zur DE-UZ 120 Ausgabe 2011 das Recht verliehen, für das Produkt

PARADOR Modular ONE Hydron

das nachstehend abgebildete Umweltzeichen als Ausweis für die besondere Umweltfreundlichkeit zu führen.



Bonn, den 30. Juni 2021

A handwritten signature in black ink.

Geschäftsführer
RAL gGmbH

ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804+A2

Owner of the Declaration	Parador GmbH
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-PAR-20210321-IBC1-EN
Issue date	31.01.2023
Valid to	30.01.2028

Design flooring Modular ONE Hydron Parador GmbH

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



1. General Information

Parador GmbH

Programme holder

IBU – Institut Bauen und Umwelt e.V.
Hegelplatz 1
10117 Berlin
Germany

Declaration number

EPD-PAR-20210321-IBC1-EN

This declaration is based on the product category rules:

Floor coverings, 01.01.0001
(PCR checked and approved by the SVR)

Issue date

31.01.2023

Valid to

30.01.2028

Design flooring Modular ONE Hydron

Owner of the declaration

Parador GmbH
Millenkamp 7-8
48653 Coesfeld
Germany

Declared product / declared unit

The declared unit is one square metre (1 m²) of design flooring Modular ONE Hydron.

Scope:

This EPD relates to the manufacture, transport, installation and disposal of an average square metre of Parador design flooring Modular ONE Hydron. The technical characteristics are described in chapter 2.3. The product is manufactured in Coesfeld, Germany.

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.

The EPD was created according to the specifications of EN 15804+A2. In the following, the standard will be simplified as *EN 15804*.

Verification

The standard EN 15804 serves as the core PCR

Independent verification of the declaration and data according to ISO
14025:2011

internally externally



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



Dr. Alexander Röder
(Managing Director Institut Bauen und Umwelt e.V.)



Angela Schindler,
(Independent verifier)

2. Product

2.1 Product description/Product definition

The multi-layered structure of Modular ONE Hydron floors is characterised by the coating of the decor foil with polypropylene (PP). This allows an authentic structuring of the decor foil and thus enables realistic reproduction of real wood surfaces. The core material of Modular ONE Hydron flooring is a waterproof, dimensionally stable polymer core board (PP-based), which is equipped with a waterproof polymer acoustic backing (polyethylene (PE) backing). A polyurethane (PUR) adhesive is used to bond the layers.

Modular ONE Hydron is 100% waterproof due to this special product structure.

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 14041:2018-05, Resilient, textile, laminate and modular multilayer floor coverings - Essential characteristics* and the CE marking. The respective national regulations apply to the use.

2.2 Application

Design floors are suitable for private and commercial indoor use. They are either installed floating on screed or other existing subfloors in conjunction with suitable 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"

2.3 Technical Data

Structural Data

Name	Value	Unit
Product thickness	5.5	mm
Wear class	23/33	
Grammage	7135	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	-

Further technical information can be found at:

<https://parador.de/en/services/downloads/design-flooring> and there under the heading "Technical data sheets".

Certificates can be found at:

<https://parador.de/en/services/downloads/design-flooring> 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 14041:2018-05, Resilient, textile, laminate and modular multi-layer floor coverings - Essential characteristics*.

You will find the declarations of performance at:

<https://parador.de/en/services/downloads/design-flooring> and there under the heading "CE - Declaration of Performance".

2.4 Delivery status

The Modular ONE Hydron floors are delivered in the following condition:

Format	
Length	856-1290 mm
Width	196-403 mm
Height	5.5 mm

2.5 Base materials/Ancillary materials

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

- PP core board: 92 %
- PE backing: 3 %
- PP wear layer/top layer: 3 %
- PUR adhesive: 2 %

The product/at least one part of the product contains substances on the Candidate List (*ECHA*) (date 17.01.2022) 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.

Biocidal products have been added to the present construction product or it has been treated with biocidal products (it is therefore a treated product within the meaning of the Biocidal Products Regulation (*Regulation (EU) No 528/2012*)): no.

2.6 Manufacture

The polymer core board, the wear layer and the polymer backing are pressed together using an 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 continuously inspected and documented as part of the in-house Factory Production Control (FPC).

2.7 Environment and health during manufacturing

At the Coesfeld site, wood chips and production waste are collected in containers provided for this purpose and disposed of.

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 design flooring, Parador recommends the use of the following tools: measuring tape, cutter, adhesive tape, pencil, hammer, and jigsaw or circular/mitre saw (ensure to use the finest possible teeth). 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 shavings and sawdust

produced during installation should be extracted. The provisions of the employers' liability insurance association apply for commercial processing.

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

Further information can be found in the installation instructions enclosed with the product or in the "Guide design flooring Vinyl and Modular ONE" (https://parador.de/pcms/downloads/downloadfile/file_id/100/).

2.9 Packaging

The planks are packed in halfshell cartons which are wrapped in PE shrink film for better protection against moisture.

Exchangeable europallets and PET strapping are also used for transport.

All packaging components can be recycled pursuant to their category.

2.10 Condition of use

Polymer materials are temperature sensitive and react to temperature changes, such as strong heating due to solar radiation, with expansion.

During use it is therefore important to ensure a balanced room climate and, if necessary, shading, in order to avoid possible dimensional changes.

The room climate should be at a temperature of approx. 20 °C and a relative humidity of between 35 and 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 current legal limits.

In terms of emission behaviour, the modular flooring meets the award criteria of *DE-UZ 120* (Blue Angel) "Contract 36424".

2.12 Reference service life

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

2.13 Extraordinary effects

3. LCA: Calculation rules

3.1 Declared Unit

The declared unit is one square metre (1 m²) of design flooring Modular ONE Hydron.

Declared unit

Name	Value	Unit
Declared unit	1	m ²
Packaging materials	0.99	kg/m ²
Layer thickness	0.0055	m
Grammage	7.129	kg/m ²
Total	7.227	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

Fire

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

Fire protection

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

N.r.: Not relevant for floor coverings

Water

The product is waterproof and will not be damaged by water standing on the surface. However, penetration of moisture to the back of the floor covering can lead to mould growth. Dangerous impact on the environment due to water exposure is not to be expected.

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 waste of this modular flooring must be recycled in accordance with *AVV 17 02 03*. If repeated use as a floor covering is no longer possible, the product is sent for thermal recycling to generate process heat and electricity.

Open burning or burning in a chimney is not possible, as the combustion of plastics results in harmful emissions. Incineration should therefore take place in a plant with connected flue gas cleaning system, such as a waste incineration plant.

2.15 Disposal

Disposal is to be organized under the following *AVV* code: 17 02 03.

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: <https://parador.de/en>

energies, including all corresponding upstream chains and the actual procurement transports. Furthermore, the entire manufacturing phase was mapped, including treatment of production waste until endofwaste 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 endofwaste status (EoW) is reached, including the associated transports at the end of the product life cycle.

Module C1 is declared with the value "0", as the Modular ONE Hydron design floor 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 the thermal utilisation of the foil packaging (A5) and the product (C3) in the form of the average European electricity mix or thermal energy from natural gas

3.3 Estimates and assumptions

It is assumed that the plastic chips (polyethylene (PE) and polypropylene (PP)) are thermally recycled in a waste incineration plant. The Modular ONE Hydron design flooring is completely recycled thermally at the end of the use phase. All benefits and avoided loads outside the system boundary are assigned to module D.

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 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 data sets contained in the databases are documented online. For the modules A1-A3 - where possible - country-

specific, and for the disposal scenarios (C modules) the corresponding European data sets were used.

3.6 Data quality

The background data sets used for balancing purposes originate from the *GaBi* databases current at the time of the calculation.

Ecoinvent datasets were only used for substances that have a very low mass fraction anyway and could theoretically be cut off.

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 data was collected in 2021.

3.8 Geographic Representativeness

Land or region, in which the declared product system is manufactured, used or handled at the end of the product's lifespan: Europe

3.9 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.

Module A1-A3 credits electricity and heat for the thermal recovery of production waste.

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.

3.10 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 used background database is *GaBi* version 10.6, content version 2021.2.

4. LCA: Scenarios and additional technical information

Characteristic product properties biogenic carbon

The product contains less than 5 % biogenic carbon. Therefore, the biogenic carbon content of the product is not indicated.

Information describing the biogenic carbon content at the factory gate

Name	Value	Unit
Biogenic carbon content in product	< 5 %	kg C
Biogenic carbon content in accompanying packaging	0.035	kg C

Transport to construction site (A4)

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

Reference service life

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

End of life (C2-C3)

Name	Value	Unit
Energy recovery	7.129	kg
Landfilling	-	kg
Transport distance truck to MVA	75	km
Truck load factor (including empty runs)	50	%

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

Name	Value	Unit
Combustible material	7.129	kg
R1 factor waste incineration plant	> 0.6	-
Lower heating value	18.3	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 design flooring Modular ONE Hydron are shown below. The following tables show the results of the impact assessment, the use of resources as well as waste and other output flows in relation to the declared unit.

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; ND = MODULE OR INDICATOR NOT DECLARED; MNR = MODULE NOT RELEVANT)

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	X	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 m² Modular ONE Hydron

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-total	kg CO ₂ eq	1.15E+01	3.98E-01	1.75E-01	0	4.87E-02	1.04E+01	0	-4.82E+00
GWP-fossil	kg CO ₂ eq	1.16E+01	3.95E-01	4.77E-02	0	4.83E-02	1.04E+01	0	-4.81E+00
GWP-biogenic	kg CO ₂ eq	-1.27E-01	0	1.27E-01	0	0	0	0	0
GWP-luluc	kg CO ₂ eq	1.72E-02	3.22E-03	5.74E-06	0	3.95E-04	6.89E-04	0	-2.96E-03
ODP	kg CFC11 eq	6.92E-10	7.77E-17	3.65E-18	0	9.53E-18	6.14E-15	0	-4.86E-14
AP	mol H ⁺ eq	2.13E-02	1.32E-03	7.09E-06	0	1.73E-04	2.64E-03	0	-5.9E-03
EP-freshwater	kg P eq	3.74E-05	1.17E-06	2.47E-09	0	1.43E-07	1.74E-06	0	-5.6E-06
EP-marine	kg N eq	6.85E-03	6.08E-04	2.1E-06	0	8.03E-05	6.62E-04	0	-1.73E-03
EP-terrestrial	mol N eq	7.29E-02	6.79E-03	3.44E-05	0	8.96E-04	1.15E-02	0	-1.85E-02
POCP	kg NMVOC eq	2.11E-02	1.19E-03	5.11E-06	0	1.57E-04	1.79E-03	0	-4.87E-03
ADPE	kg Sb eq	3E-06	3.49E-08	1.13E-10	0	4.28E-09	9.03E-08	0	-7.36E-07
ADPF	MJ	3.03E+02	5.24E+00	1.47E-02	0	6.43E-01	8.44E+00	0	-8.33E+01
WDP	m ³ world eq deprived	4.25E+00	3.65E-03	4.33E-03	0	4.48E-04	1.4E+00	0	-3.27E-01

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; WDP = Water (user) deprivation potential)

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 m² Modular ONE Hydron

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	4.74E+01	3.02E-01	1.41E+00	0	3.7E-02	1.96E+00	0	-1.67E+01
PERM	MJ	1.41E+00	0	-1.41E+00	0	0	0	0	0
PERT	MJ	4.88E+01	3.02E-01	1.65E-03	0	3.7E-02	1.96E+00	0	-1.67E+01
PENRE	MJ	1.73E+02	5.26E+00	1.47E-02	0	6.45E-01	1.39E+02	0	-8.33E+01
PENRM	MJ	1.3E+02	0	0	0	0	-1.3E+02	0	0
PENRT	MJ	3.03E+02	5.26E+00	1.47E-02	0	6.45E-01	8.44E+00	0	-8.33E+01
SM	kg	7.48E-02	0	0	0	0	0	0	9.2E-03
RSF	MJ	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0
FW	m ³	5.2E-02	3.46E-04	1.02E-04	0	4.24E-05	3.35E-02	0	-1.64E-02

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 – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1 m² Modular ONE Hydron

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
HWD	kg	7.79E-08	2.77E-10	1.5E-12	0	3.4E-11	1.71E-09	0	-1.84E-08
NHWD	kg	1.65E-01	8.25E-04	1.88E-04	0	1.01E-04	1.83E+00	0	-3.7E-02
RWD	kg	9.02E-03	9.54E-06	3.43E-07	0	1.17E-06	5.24E-04	0	-5.38E-03
CRU	kg	0	0	0	0	0	0	0	0
MFR	kg	0	0	8.4E-02	0	0	0	0	0
MER	kg	3.76E-01	0	1.5E-02	0	0	7.13E+00	0	0
EEE	MJ	0	0	1E-01	0	0	1.82E+01	0	0

EET	MJ	0	0	1.78E-01	0	0	4.13E+01	0	0
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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; EET = Exported thermal energy

RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional: 1 m² Modular ONE Hydron

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PM	Disease incidence	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	SQP	ND	ND	ND	ND	ND	ND	ND	ND

PM = Potential incidence of disease due to PM emissions; IR = Potential Human exposure efficiency relative to U235; ETP-fw = Potential comparative Toxic Unit for ecosystems; HTP-c = Potential comparative Toxic Unit for humans (cancerogenic); HTP-nc = Potential comparative Toxic Unit for humans (not cancerogenic); SQP = Potential soil quality index

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

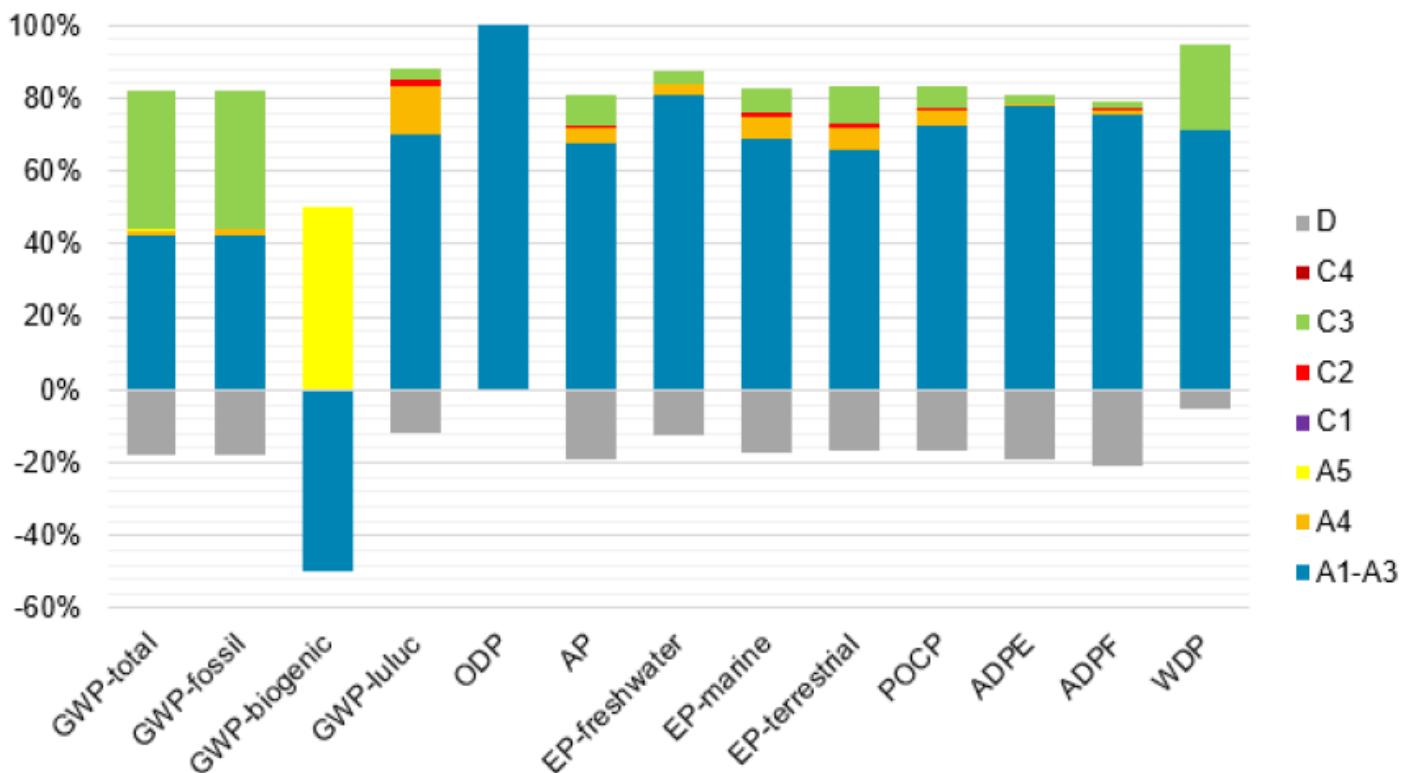
Limitation note 1 - applies to the indicator: Potential Human exposure efficiency relative to U235 (IR)

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

Limitation note 2 - applies to the indicators: Abiotic depletion potential for non-fossil resources (ADPE), Abiotic depletion potential for fossil resources (ADPF), Water (user) deprivation potential (WDP), Potential comparative Toxic Unit for ecosystems (ETP-fw), Potential comparative Toxic Unit for humans (HTP-c), Potential comparative Toxic Unit for humans (HTP-nc), Potential Soil Quality Index (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

Dominance Analysis



Environmental impacts

The dominance analysis shows that the manufacturing phase (modules A1-A3) is dominant in most impact categories of the floor covering. GWP-biogenic is offset in module A5 by the recycling of the packaging materials. Thermal recovery of the flooring at the end of life (Module C3) has a significant impact on the GWP-total and GWP-fossil indicators.

In the manufacturing phase (modules A1-A3), the datasets used for the core board contribute the most to the potential environmental impacts in most of the categories considered.

This is due to the high mass proportion of core board in the product.

Primary energy

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

Range of results

The floors differ in the appearance of the decors. Therefore, a significant variance of the LCA results is not expected.

7. Requisite evidence

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: 56073-001

Test method: Emission analysis according to EN 16516

Results overview (3 days)

Name	Value	Unit
HCHO	0	µg/m³
TVOC	12	µg/m³
TSVOC	< 5	µg/m³
KMR 1	< 1	µg/m³

Reaction to Fire

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

Test report: 21-000210-02

Test method: Reaction to Fire according to EN 13501-1

Certificate DE-UZ 120 Blue Angel

Modular ONE Hydron (contract no. 36424) may use the eco-label "Blue Angel" on the basis of the above-mentioned trademark agreements of RAL gGmbH, Fränkische Straße 7, 53229 Bonn, Germany and the of the Federal Environment Agency because they are low in emissions.

8. References

Standards

EN 13501-1

DIN EN 13501-1:2019-05, Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests.

EN 14041

DIN EN 14041:2018-05, Resilient, textile, laminate and modular multilayer floor coverings - Essential characteristics.

EN 15804

DIN EN 15804:2012+A2:2019+AC:2021, Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products.

EN 16511

DIN EN 16511:2019-07, Loose-laid panels - Semi-rigid multilayer modular floor covering (MMF) panels with wear resistant top layer.

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

AgBB Scheme - August 2018

Indoor air quality requirements in buildings: health assessment of emissions of volatile organic compounds (VOCs, VOCs and SVOCs) from building products.

AVV

Waste Catalogue Ordinance (AVV) of 10 December 2001 (BGBI. I p. 3379), last amended by Article 1 of the Ordinance of 30 June 2020 (BGBI. I p. 1533).

BNB

BNB Code No. 352.711 Useful lives of building components for life cycle analyses according to the Sustainable Building Assessment System, 2017: Linoleum, laminate, PVC, plastic engineered wood flooring, cork, rubber, sports hall coverings. Berlin: Federal Ministry of the Interior, for Construction and Home Affairs.

DE-UZ 120

'Blue Angel' eco-label for low-emission elastic floor coverings. Modular ONE Hydron, Contract No.: 36424; Bonn: RAL gGmbH, Dessau-Roßlau: Federal Environment Agency, 30.06.2021.

ECHA

List of Candidate Substances of Very High Concern for Authorisation (ECHA Candidate List), dated 17.01.2022, published in accordance with Article 59(10) of the REACH Regulation. Helsinki: European Chemicals Agency.

ecoinvent

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 eco-management and audit scheme (EMAS), repealing Regulation (EC) No 761/2001 and Commission Decisions 2001/681/EC and 2006/193/EC.
<https://www.emas.de/home/>

GaBi

GaBi 10.6: 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.ibuepd.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. (ed.), 2021.

PCR: Floor coverings

Product category rules for building-related products and services. Part B: EPD requirement for floor coverings, version 1.2. Berlin: Institut Bauen und Umwelt e.V. (ed.), 14.02.2018.

Test report: 56073-001

Emission analysis of Modular ONE Hydron according to EN 16516. Cologne: eco-INSTITUT Germany GmbH. 16.03.2021.

Test report: 21-000210-02

Classification of the Reaction to Fire of Modular ONE Hydron according to EN 13501-1:2010. Aachen: TFI Aachen GmbH. 26.03.2021.

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:02011R0305-20210716&from=EN>

Regulation (EU) No 528/2012

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

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