

ENVIRONMENTAL PRODUCT DECLARATION

as per *ISO 14025* and *EN 15804+A2*

Owner of the Declaration	Hamberger Flooring GmbH & Co. KG
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
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DISANO design floor
Hamberger Flooring GmbH & Co. KG

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Small picture
max. 4 MB

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1. General Information

Hamberger Flooring GmbH & Co. KG Programme holder IBU – Institut Bauen und Umwelt e.V. Hegelplatz 1 10117 Berlin Germany	DISANO design floor Owner of the declaration Hamberger Flooring GmbH & Co. KG Rohrdorfer Straße 133 83071 Stephanskirchen Germany						
Declaration number EPD-HAM-20220105-ICB1-EN	Declared product / declared unit 1 m² DISANO by HARO Design floor						
This declaration is based on the product category rules: Floor coverings, 02.2018 (PCR checked and approved by the SVR)	Scope: This product declaration refers to an average square metre of Hamberger design flooring produced at the factory in Germany. The average was calculated according to the surface area produced in one year. 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 <i>EN 15804+A2</i> . In the following, the standard will be simplified as <i>EN 15804</i> .						
Issue date 08.08.2022	Verification <table border="1"> <tr> <td colspan="2">The standard <i>EN 15804</i> serves as the core PCR</td> </tr> <tr> <td colspan="2">Independent verification of the declaration and data according to <i>ISO 14025:2011</i></td> </tr> <tr> <td><input type="checkbox"/> internally</td> <td><input checked="" type="checkbox"/> externally</td> </tr> </table>	The standard <i>EN 15804</i> serves as the core PCR		Independent verification of the declaration and data according to <i>ISO 14025:2011</i>		<input type="checkbox"/> internally	<input checked="" type="checkbox"/> externally
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Valid to 07.08.2027							
 Dipl. Ing. Hans Peters (chairman of Institut Bauen und Umwelt e.V.)	 Prof. Dr. Birgit Grahl (Independent verifier)						
 Dr. Alexander Röder (Managing Director Institut Bauen und Umwelt e.V.)							

2. Product

2.1 Product description/Product definition

DISANO is a multi-layer, modular design floor covering manufactured by Hamberger taking into account *EN 16511*. By combining layers and materials into different product structures, this product line creates floor coverings for a wide variety of applications and needs.

DISANO ClassicAqua: The surface of the design floor is equipped with a pressure distribution layer for maximum walking comfort. The ClassicAqua flooring is available in many stone and wood designs in tile and plank format with a height of 9.3 mm.

DISANO LifeAqua and HydroStar: The LifeAqua and HydroStar ranges differ in the designs of the surface, in the formats of the planks and tiles and in the height (LifeAqua: 8.5 mm, HydroStar: 6.5 mm).

DISANO WaveAqua: The highly scratch-resistant floor covering is available in wood designs as short plank or country house plank (height 8 mm).

DISANO Saphir: A plastic film on a solid plastic core board forms a completely waterproof floor. The available formats are tile and short plank with 4.5 mm height.

DISANO Project: The completely waterproof floor covering is built on a resilient support mat. The floor covering is only suitable for full-surface gluing and is particularly renovation-friendly with a height of only 2 mm. Available as tile or short plank.

The surface of all product groups is printed with a decorative wood or stone look. By embossing the surface structure, an authentic copy of natural materials can be created. With the exception of DISANO Project, the planks are equipped with a milled connection profile all around the sides for glueless installation. All layers are glued together. The declared product represents an area-weighted average of the design floors produced within one year.

Regulation (EU) No 305/2011 (CPR) applies to the placing of the product on the market in the EU/EFTA (with the exception of Switzerland). The product has a declaration of performance according to harmonised standard *DIN EN 14041:2008, Resilient, textile, laminate and modular multilayer floor coverings - Essential characteristics* and a CE marking. The respective national regulations apply to the use.

2.2 Application

DISANO is a multi-layer, semi-rigid, modular floor covering manufactured taking into account *EN 16511* for commercial and private use in dry interior areas, which can be laid as a floating floor or glued down over the entire surface (DISANO Project: only glued down installation possible).

The installation must be carried out in accordance with the installation instructions, the rules of the trade and the current state of the technology.

2.3 Technical Data

According to *Regulation (EU) No 305/2011*, the following technical data of the products within the scope of the EPD shall be provided:

Technical data DISANO ClassicAqua, HydroStar, LifeAqua, Saphir and WaveAqua

- Total thickness: 6.5-9.3 mm
- Weight per unit area: 5.6-8.7 kg/m²
- Product shape: Tile, Plank
- Length of the top layer: 631-2200 mm
- Width of the top layer: 193-313 mm
- Use class: 23/33
- Emissions of VOC: ≤ 0.025 mg/m³
- Formaldehyde emissions according to *EN 717-1*: < 100 µg/m³
- Content of hazardous substances: compliant, not actively added
- Thermal conductivity: 0.125-0.15 W/(m*K)
- Slip resistance: $\mu \geq 0.30$
- Electrical behaviour: no performance declared
- Resistance to water: no performance declared

Technical data DISANO Project

- Total thickness: 2 mm
- Weight per unit area: 3.33 kg/m²
- Product shape: Tile, Plank
- Length of the top layer: 650-1300 mm
- Top layer width: 248-310 mm
- Emissions of VOC: ≤ 0.017 mg/m³
- Formaldehyde emissions according to *EN 717-1*: < 100 µg/m³
- Content of hazardous substances: compliant, not actively added
- Thermal conductivity: 0.147 W/(m*K)
- Slip resistance: $\mu \geq 0.30$
- Electrical behaviour: Antistatic
- Resistance to water: no property specified

The performance values of the product correspond to the declaration of performance in relation to its essential characteristics according to *EN 14041*. The assessment and verification of constancy of performance are carried out according to system 3 by involving notified bodies.

2.4 Delivery status

The DISANO product range includes flooring planks in various formats:

- Stone design tiles with lengths from 631 to 650 mm and widths from 310 to 313 mm
- Wood design planks with lengths from 1282 to 2200 mm and widths from 193 to 248 mm

The wood moisture content of the high-density fibreboard (HDF) is approx. 5 % on delivery.

One packaging unit corresponds to approx. 1.4 to 3.5 m², depending on the format. The weight per unit area is between 3.3 and 8.7 kg/m².

2.5 Base materials/Ancillary materials

One square metre of DISANO flooring, averaged over the area produced in one year of each type, is made up of the following material components (in mass %):

- HDF core board 67 %
- Water content 4 %
- Polyethylene terephthalate (PET) core board 5 %.
- PET decorative layer 7 %
- Polyethylene (PE) insulation mat 9 %
- Cork 4 %
- Polyurethane (PUR) adhesive 4%
- Lacquer < 1 %

The product/product/at least one sub-product contains substances on the *ECHA Candidate List of Substances of Very High Concern (SVHC)* (date 08.07.2021) above 0.1% by mass: no.

The product/product/at least one sub-product contains other CMR substances of category 1A or 1B not on the candidate list above 0.1% by mass in at least one sub-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 (*EU*) No 528/2012): no.

2.6 Manufacture

To produce DISANO ClassicAqua, LifeAqua and HydroStar floor coverings, an HDF core board is laminated on both sides. A vapour barrier and a cork mat are glued to the underside. For ClassicAqua, a decoratively printed plastic film is laminated over an elastic pressure distribution layer as a surface on the board. For LifeAqua and HydroStar floor coverings, the plastic film is applied directly to the HDF board.

For DISANO WaveAqua, a polymer surface and an embossed underside are pressed onto an HDF board. The surface is sealed with a multi-layer lacquer finish.

For the production of DISANO Saphir and Project floor coverings, a plastic film is laminated onto a waterproof backing material; in the case of Saphir onto a plastic board, in the case of Project onto an elastic mineral-filled insulation mat.

Solvent-free hot-melt adhesive is used for gluing in all DISANO variants.

In the final production stage, the glued panels are cut into the plank or tile dimensions and profiled. In the

process, a geometry corresponding to the respective joint system is milled. DISANO Project is cut to a smooth edge.

The final product is packaged in cardboard and foil, which protect the elements from climatic fluctuations and mechanical damage.

The company Hamberger Flooring carries the following certifications:

- Quality management according to *ISO 9001* since 1995
- Environmental management according to *ISO 14001* since 1998
- Energy management according to *ISO 50001* since 2012

2.7 Environment and health during manufacturing

Environmental protection measures in the manufacturing process:

- Use of wood-based materials from suppliers with *PEFC certification*
- Generating electricity and heat from wood residues from the production
- Electricity generation from hydropower

Health protection measures in the manufacturing process:

- Provision of hearing protection
- Provision of safety shoes
- Provision of protective clothing, goggles and gloves where required
- Use of solvent-free paint and adhesive systems
- Instruction on occupational safety and behaviour in an emergency
- First aider training for employees

2.8 Product processing/Installation

DISANO can be processed with tools suitable for woodworking. The work safety instructions applicable to wood processing (e.g. ear protection, protective goggles) must be followed. In case of dust formation attention should be paid to exhaust ventilation or the wearing of respiratory protection.

Required tools may only be used for their intended purpose and in accordance with the manufacturer's operating instructions. In case of commercial processing, the regulations of the employers' liability insurance associations must be followed.

The installation instructions can be downloaded from the "Service" section at www.haro.com.

The design floors can be installed as floating floors or glued to the subfloor over the entire surface. A low-emission adhesive approved for floor coverings, e.g. HARO Flexible Glue, is recommended. DISANO Project must be glued down over the entire surface. DISANO Project and DISANO Saphir are also approved for installation in bathrooms.

2.9 Packaging

The packaging is composed of cardboard and PE foil. The various packaging materials are to be collected separately and recycled in accordance with local legal regulations.

2.10 Condition of use

Wood-based materials can absorb and release water (vapour). If the carrier board of the design floor consists of a high-density fibreboard, an indoor climate with a temperature of approx. 20 °C and a relative humidity between 30 and 65 % protects the floor from unwanted dimensional changes.

Cleaning the floor according to the care instructions is recommended.

If used as intended, no damage is to be expected.

2.11 Environment and health during use

When used as directed, no hazards to water and soil are expected.

According to emission test reports the indoor air quality is not impaired by DISANO. The product meets the criteria of the following specifications:

- *AgBB Scheme - August 2018*
- A+ émissions dans l'air intérieur according to French *VOC regulation FR*
- *DE-UZ 176 Blue Angel*; DISANO Project: *DE-UZ 120 Blue Angel*

2.12 Reference service life

According to the BBSR table "Service Life of Building Components for life cycle analysis according to *BNB*", the service life is 20 years (code no. 352.711).

If used as intended, no damage is to be expected.

2.13 Extraordinary effects

Fire

According to the fire test in accordance with *EN 13501-1*, the design floor covering has been rated with the following classifications:

- DISANO Project: Cfl -s1
- DISANO Saphir: Dfl -s2; for full-surface bonding: Cfl -s2
- DISANO ClassicAqua: Dfl -s1
- DISANO LifeAqua and WaveAqua: Cfl -s1

Water

No components that could be harmful to water can be washed out. Floor coverings with an HDF core board are not resistant to permanent exposure to water.

Mechanical destruction

Mechanical damage can be repaired locally. There is no danger to the environment. There is a risk of injury at broken edges.

2.14 Re-use phase

Floating design floor coverings can be removed and re-installed without destroying the floor.

2.15 Disposal

Disposal of the floor covering with household waste (AVV class 20 03 01) is possible.

The packaging materials cardboard and PE foil can be separately assigned to *AVV classes* 20 01 01 (paper and cardboard) and 15 01 02 (plastic packaging). Floor

coverings contaminated with adhesive residues can be disposed of as construction site waste.

2.16 Further information

Further product information and documents on installation, maintenance and explained services are available at www.haro.com.

3. LCA: Calculation rules

3.1 Declared Unit

The declared unit is one square metre (1 m²) of average DISANO design floor including packaging materials. The average was formed on the basis of the m² produced in 2020 of the floors considered.

Declared unit

Name	Value	Unit
Declared unit	1	m ²
Grammage	6.52	kg/m ²
Packaging materials	0.11	kg/m ²
Total	6.63	kg/m ²
Layer thickness	0.0072	m
Gross density	905	kg/m ³

3.2 System boundary

Type of EPD: Cradle to factory gate with options.

Modules A1-A3 and A5

The product stage (A1-A3) begins with the consideration of the production of the necessary raw materials and energies, including all corresponding upstream chains and procurement transport. Furthermore, the entire manufacturing phase was mapped, including the treatment of production waste until the end-of-waste status (EoW) is reached. Module A5 considers the disposal of packaging materials. However, product losses as well as electricity-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 fractions until the end-of-waste status (EoW) is reached, including the associated transports at the end of the product life cycle. No processes are considered for dismantling (Module C1), as manual dismantling is assumed. In Module C3, thermal recovery is modelled. No materials are landfilled, so no loads/benefits are taken into account in Module C4.

Module D

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

3.3 Estimates and assumptions

It was assumed that all offcuts from manufacturing are thermally utilised and that cork residues in A1-A3 are thermally utilised together with wood chips.

It was assumed that end-of-life thermal waste utilisation plants are those whose R1 factor (energy conversion efficiency or energy efficiency of waste

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

3.4 Cut-off criteria

The polyolefin vapour barrier and the connecting profiles were cut off.

The sum of the neglected processes is < 1 % of the material inputs. It can therefore be assumed that the sum of the neglected processes does not exceed 5 % of the impact categories considered.

3.5 Background data

Basically, the background database *GaBi 10.5* in content version 2021.2 was used. If no suitable data sets were available in the *GaBi* background database, data sets from the *ecoinvent 3.6 database* were used.

3.6 Data quality

The primary data was provided by Hamberger Flooring GmbH & Co. KG and checked for plausibility. The quality and representativeness of the data collected can therefore be considered high.

The data quality of the background data used was rated as good in terms of technical, geographical, and temporal representativeness. The majority of the background data used is from the reference year 2020.

Regarding the robustness of the LCA values, it can be stated that the balanced potential environmental impacts largely result from the background data. Thus, the influence of the background data and pre-products is high compared to the environmental impacts caused by the actual production.

3.7 Period under review

The data basis of the present LCA is based on data recordings from the year 2021.

3.8 Allocation

Module A1-A3

Wood residues that are internally, thermally utilised were considered as a closed loop.

An economic allocation of the by-products was dispensed with, as the product value exceeds that of the by-products many times over and no significant influence on the LCA results is to be expected.

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 *GaBi* background database Content version 2021.1 was used.

4. LCA: Scenarios and additional technical information

Characteristic product properties Information on biogenic carbon

Information describing the biogenic carbon content at the factory gate

Name	Value	Unit
Biogenic carbon content in product	1.983	kg C
Biogenic carbon content in accompanying packaging	0.04	kg C

Reference service life

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

End of life (C1–C4)

Name	Value	Unit
Energy recovery	6.52	kg
Landfilling	0	kg
Transport distance (truck to waste-to-energy plant)	75	km
Truck load factor (including empty runs)	50	%

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

Name	Value	Unit
Combustion material	6.52	kg
R1 factor MVA	> 60	%
Lower calorific value	16.7	MJ/kg

5. LCA: Results

Important notice:

EP-freshwater: This indicator was calculated as "kg P-eq." in accordance with the characterisation model (EUTREND-Modell, Struijs et al., 2009b, wie in ReCiPe umgesetzt; <http://eplca.jrc.ec.europa.eu/LCDN/developerEF.xhtml>)).

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	ND	X	ND	ND	MNR	MNR	MNR	ND	ND	X	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 m2 DISANO design floor

Core Indicator	Unit	A1-A3	A5	C1	C2	C3	C4	D
GWP-total	[kg CO ₂ -Eq.]	1.25E+0	2.01E-1	0.00E+0	4.43E-2	1.16E+1	0.00E+0	-4.12E+0
GWP-fossil	[kg CO ₂ -Eq.]	8.65E+0	5.55E-2	0.00E+0	4.39E-2	4.31E+0	0.00E+0	-4.12E+0
GWP-biogenic	[kg CO ₂ -Eq.]	-7.42E+0	1.45E-1	0.00E+0	1.95E-8	7.27E+0	0.00E+0	4.29E-5
GWP-luluc	[kg CO ₂ -Eq.]	2.09E-2	6.73E-6	0.00E+0	3.59E-4	2.12E-4	0.00E+0	-2.78E-3
ODP	[kg CFC11-Eq.]	4.62E-9	4.25E-18	0.00E+0	8.67E-18	2.41E-15	0.00E+0	-4.58E-14
AP	[mol H ⁺ -Eq.]	2.35E-2	8.28E-6	0.00E+0	1.57E-4	5.03E-3	0.00E+0	-5.31E-3
EP-freshwater	[kg P-Eq.]	1.14E-4	2.89E-9	0.00E+0	1.30E-7	3.56E-7	0.00E+0	-5.25E-6
EP-marine	[kg N-Eq.]	1.01E-2	2.46E-6	0.00E+0	7.31E-5	2.26E-3	0.00E+0	-1.52E-3
EP-terrestrial	[mol N-Eq.]	9.57E-2	4.02E-5	0.00E+0	8.15E-4	2.73E-2	0.00E+0	-1.63E-2
POCP	[kg NMVOC-Eq.]	2.55E-2	5.96E-6	0.00E+0	1.42E-4	5.85E-3	0.00E+0	-4.27E-3
ADPE	[kg Sb-Eq.]	3.57E-6	1.32E-10	0.00E+0	3.89E-9	3.76E-8	0.00E+0	-6.72E-7
ADPF	[MJ]	2.05E+2	1.72E-2	0.00E+0	5.85E-1	3.71E+0	0.00E+0	-7.14E+1
WDP	[m ³ world-Eq deprived]	4.70E+0	5.05E-3	0.00E+0	4.07E-4	1.24E+0	0.00E+0	-3.08E-1

Caption: GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources; WDP = Water (user) deprivation potential

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 m2 DISANO design floor

Indicator	Unit	A1-A3	A5	C1	C2	C3	C4	D
PERE	[MJ]	5.12E+1	1.61E+0	0.00E+0	3.36E-2	8.29E+1	0.00E+0	-1.58E+1
PERM	[MJ]	8.38E+1	-1.61E+0	0.00E+0	0.00E+0	-8.22E+1	0.00E+0	0.00E+0
PERT	[MJ]	1.35E+2	1.92E-3	0.00E+0	3.36E-2	6.91E-1	0.00E+0	-1.58E+1
PENRE	[MJ]	1.51E+2	7.67E-1	0.00E+0	5.87E-1	5.68E+1	0.00E+0	-7.14E+1
PENRM	[MJ]	5.38E+1	-7.50E-1	0.00E+0	0.00E+0	-5.31E+1	0.00E+0	0.00E+0
PENRT	[MJ]	2.05E+2	1.72E-2	0.00E+0	5.87E-1	3.71E+0	0.00E+0	-7.14E+1
SM	[kg]	7.48E-2	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
NRSF	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
FW	[m ³]	1.80E-1	1.19E-4	0.00E+0	3.85E-5	2.92E-2	0.00E+0	-1.54E-2

Caption: PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1 m2 DISANO design floor

Indicator	Unit	A1-A3	A5	C1	C2	C3	C4	D
HWD	[kg]	1.14E-6	1.75E-12	0.00E+0	3.09E-11	7.75E-10	0.00E+0	-1.60E-8
NHWD	[kg]	2.45E-1	2.18E-4	0.00E+0	9.21E-5	2.31E-1	0.00E+0	-3.31E-2
RWD	[kg]	3.42E-3	3.99E-7	0.00E+0	1.06E-6	1.52E-4	0.00E+0	-5.07E-3
CRU	[kg]	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	9.86E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
MER	[kg]	1.80E-1	1.75E-2	0.00E+0	0.00E+0	6.52E+0	0.00E+0	0.00E+0
EEE	[MJ]	0.00E+0	1.17E-1	0.00E+0	0.00E+0	1.72E+1	0.00E+0	1.73E+1
EET	[MJ]	1.95E+0	2.07E-1	0.00E+0	0.00E+0	3.26E+1	0.00E+0	3.28E+1

Caption: HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy

RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional: 1 m2 DISANO design floor

Indicator	Unit	A1-A3	A5	C1	C2	C3	C4	D
PM	[Disease Incidence]	ND	ND	ND	ND	ND	ND	ND
IRP	[kBq U235-Eq.]	ND	ND	ND	ND	ND	ND	ND
ETP-fw	[CTUe]	ND	ND	ND	ND	ND	ND	ND
HTP-c	[CTUh]	ND	ND	ND	ND	ND	ND	ND
HTP-nc	[CTUh]	ND	ND	ND	ND	ND	ND	ND
SQP	[-]	ND	ND	ND	ND	ND	ND	ND
Caption	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							

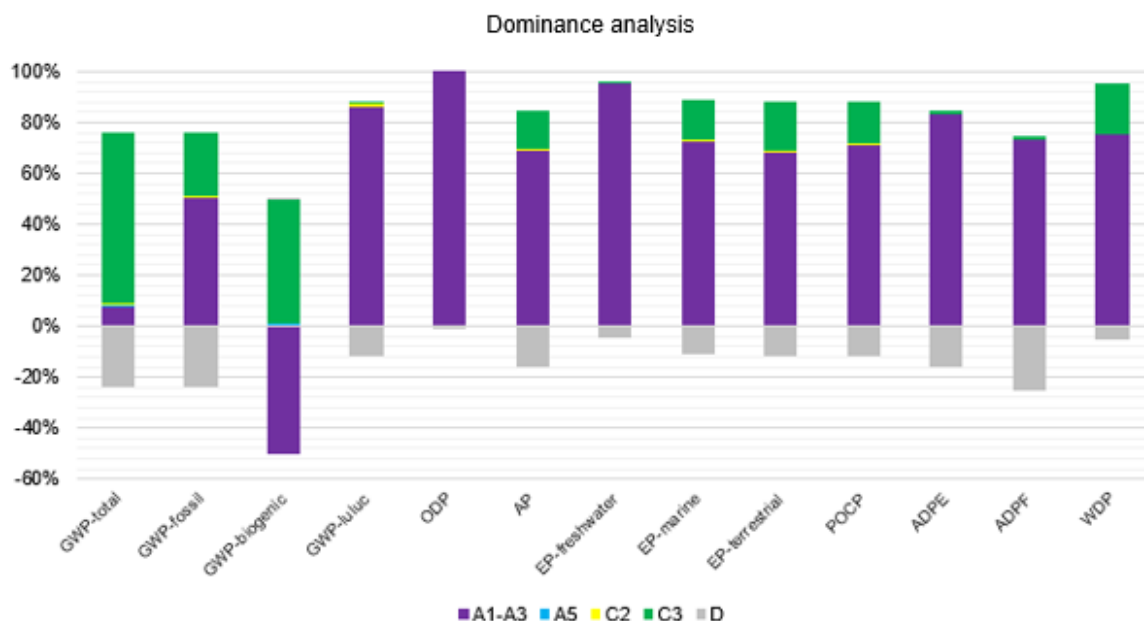
Disclaimer 1 – for the indicator “Potential Human exposure efficiency relative to U235” (IR).

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

Disclaimer 2 – for the indicators “abiotic depletion potential for non-fossil resources”, “abiotic depletion potential for fossil resources”, “water (user) deprivation potential, deprivation-weighted water consumption”, “potential comparative toxic unit for ecosystems”, “potential comparative toxic unit for humans – cancerogenic”, “Potential comparative toxic unit for humans not cancerogenic”, “potential soil quality index”.

The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced 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 considered life cycle of the DISANO design floor. The indicators global warming potential total (GWP-total) and global warming potential biogenic (GWP-biogenic) are an exception. Here, the disposal of the design floor makes the largest contribution to the potential environmental impacts. This is due to the fact that in the assumed thermal utilisation of the flooring, the biogenic carbon stored in the product is emitted as biogenic CO₂ emissions. This is also the reason why the sum of the biogenic CO₂ emissions over the life cycle of the product is balanced (equal to 0).

In the manufacturing phase (modules A1-A3), the data sets used for the HDF board and the PUR adhesive contribute the most to the potential environmental impacts in majority of the categories considered.

The indicators global warming potential luluc (GWP-luluc), eutrophication potential freshwater (EP-freshwater), Abiotic depletion potential for non-fossil resources (ADPE) and water (user) deprivation potential (WDP) are most influenced by the data set for the PUR adhesive. The greatest impact on the indicators acidification potential of soil and water (AP), eutrophication potential saltwater (EP-marine), eutrophication potential (EP-terrestrial) and formation

potential of tropospheric ozone photochemical oxidants (POCP) has the HDF board. The greatest impact on potential for depletion of abiotic resources - fossil fuels (ADPF) have plastic components of the flooring.

Primary energy

The demand for renewable primary energy is mainly influenced by the manufacturing phase and there by the data set for the HDF board. The demand non-renewable primary energy demand is influenced by the plastic core board, PET decorative film and the insulation mat production.

Range of results

For the range of results, the indicators GWP-fossil and PENRT were considered. For both indicators, both in the manufacturing phase (modules A1-A3) and across all modules considered (excluding module D), the highest values are recorded for floors consisting entirely of plastic components. Lower indicator values were calculated for floors with an HDF core board and thus lower plastic content.

7. Requisite evidence

VOC emissions

DISANO	Test center	No. Test report	Date	Emissions Formaldehyde (AgBB 28d)	Emissions VOC (AgBB 2018 28d)
Classic Aqua	eco Institut Köln	56368-001-AgBB-L	16.07.2021	2 µg/m³	12 µg/m³
Life Aqua	eco Institut Köln	56359-002-AgBB-L	02.08.2021	3 µg/m³	25 µg/m³
Wave Aqua	eco Institut Köln	55212-B001 II	06.07.2020	3 µg/m³	7 µg/m³
Saphir	eco Institut Köln	54163-002-007 III	10.03.2020	< 2 µg/m³	7 µg/m³
Project	eco Institut Köln	56359-001-AgBB-L	05.08.2021	<< NIK	12 µg/m³

Credentials for fire safety

DISANO	No. Test report	Date	Classification
Classic Aqua	2718343/2	31.08.2018	C ₁ s1
Life Aqua	2719648/2	17.12.2019	C ₁ s1
Wave Aqua	2720009	18.02.2020	C ₁ s1
Saphir	2718343/3 A1	23.10.2018	C ₁ s2
Project	2717255	29.05.2017	B ₁ s1

"Blue Angel" eco label

DISANO	Contract no.	Date	Award basis
Classic Aqua	31327	12.10.2017	RAL-UZ 176 (2013)
Life Aqua	34351	27.02.2020	DE-UZ 176 (2013)
Wave Aqua	35273	28.01.2021	DE-UZ 176 (2013)
Saphir	32002	04.04.2018	DE-UZ 120 (2011)
Project	32003	28.03.2018	DE-UZ 120 (2011)

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ISO 9001

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EN 16516

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