

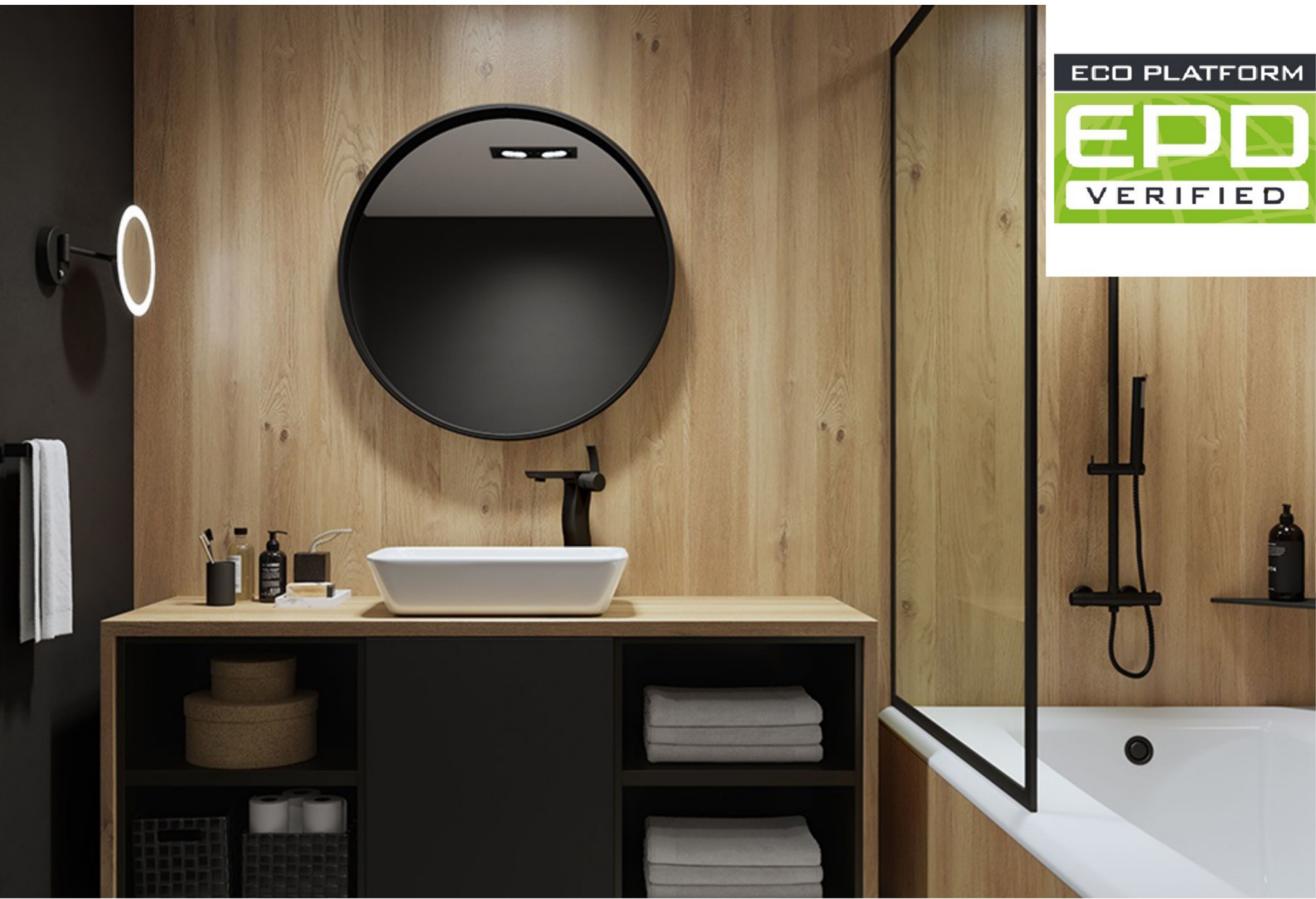
ENVIRONMENTAL-PRODUCT DECLARATION

as per ISO 14025 and EN 15804+A2

Owner of the Declaration	POLYREY
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-WIL-20230102-CBA1-EN
Issue date	04.10.2023
Valid to	03.10.2028

Polyrey Nuance wetroom wall panels Wilsonart

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



1. General Information

Wilsonart

Programme holder

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

Declaration number

EPD-WIL-20230102-CBA1-EN

This declaration is based on the product category rules:

Decorative board for interior use, 01.08.2021
(PCR checked and approved by the SVR)

Issue date

04.10.2023

Valid to

03.10.2028



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



Florian Pronold
(Managing Director Institut Bauen und Umwelt e.V.)

Polyrey Nuance wetroom wall panels

Owner of the declaration

POLYREY
Route de Bergerac 700
24150 Baneuil
France

Declared product / declared unit

1 square meter of Nuance panel

Scope:

The declaration covers a tongue-and-groove system of bathroom and wetroom wall panels thickness 11,7 mm+/-0,6 mm. The system is named Polyrey Nuance wetroom wall panels. The declaration covers the total range of colors. The product is manufactured by WILSONART in its Wellingborough plant (UK).

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 bezeichnet*.

Verification

The standard EN 15804 serves as the core PCR

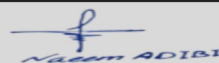
Independent verification of the declaration and data according to ISO 14025:2011

☐

internally

☒

externally



Dr Naeem Adibi,
(Independent verifier)

2. Product

2.1 Product description/Product definition

Polyrey Nuance wetroom Wall panels described in the EPD are made from a water-resistant composite material board, glued on 2 sides with High Pressure Laminate (HPL), conforming to EN438-3 with a humid-resistant glue. The complete panel conforms to EN438-7. The decorative side, made with HPL, permits a large range of decors and finishes. The backing side is made with a balancing HPL.

Nuance has been treated with Sanitized® – an antibacterial protection that eliminates 99.9 % of bacteria.

Nuance panel has a rounded edge for optimum finish and hygiene. The tongue-and-groove assembly system permits ease of installation and seamless joints.

The final installation is made with Complete adhesive and Complete colour-matched sealants, ensuring long-term prevention of any water ingress. For the placing on the market in the European Union/European Free Trade Association (EU/EFTA) (except for Switzerland) the Regulation (EU) No 305/211 applies. The products need a Declaration of Performance taking into consideration EN 438-7, and all have a CE-marking.

2.2 Application

Nuance is a patented wall-covering solution suitable for new or refurbished bathrooms and wetrooms. It can be used instead of or on top of existing tiling without having to smooth the surface down first, or on moisture resistant plasterboard.

2.3 Technical Data

Nuance panels are evaluated according EN438-2 as HPL bonded board. Detailed information can be found in the technical data sheet.

Constructional data

Name	Value	Unit
Gross density	700	kg/m ³
Grammage	8.34	kg/m ²
Impact resistance acc. to EN 438-2-21	600	mm
Resistance to scratches acc. to EN 438-2-25	Min D3 except BRI min D2	Degree
Light resistance acc. to EN 438-2-27	4 - 5	-
Surface adhesion ISO 13894-1-9	1	MPa
Durability - resistance in wet conditions - 48 h at 40°C EN 438-2-15 modified	Mass increase < 8	%
Durability - resistance in wet conditions 48h at 40°C EN 438-2-15 modified	>= 4	Degree
Flatness EN 438-2-9	<= 3	mm/linear meter
Dimensional tolerance EN 438-2-5 and 6	Height: +/- 1,5 - Width: +/- 1 - Thickness: +0,4/-0,2	mm
Squareness EN 438-2-8	<=1,5	mm/linear meter
Stain resistance EN 438-2-26	Group 1&2: 5 - Group 3: 4	Grade
Resistance to abrasion EN 438-2-10	150-450	Taber rounds

Performance values of the product are stated in the declaration of performance, in relation to its essential characteristics according to EN438-7:2005 (High-pressure decorative laminates (HPL) - Sheets based on thermosetting resins (Usually called Laminates) - Part 7: Compact laminate and HPL composite panels for internal and external wall and ceiling finishes)

2.4 Delivery status

Standard size of panels are:

260 × 120 cm rounded edge/tongue

260 × 120 cm tongue/groove

260 × 60 cm tongue/groove

Thickness 11,7 mm +/- 0,6 mm

2.5 Base materials/Ancillary materials

The composition of Nuance panels in mass is:

. 73 % water-resistant composite board

. 26 % HPL surface and backing

. 1 % PUR glue.

The product contains 14 % recycled content from HPL (paper) and board (PVC) (pre-consumer and post-consumer).

The core is a water-resistant composite board density of 600 kg/m³.

The surface and back side are HPL Polyrey conforming to EN438-3.

The gluing is made with water-resistant PUR glue.

The product contains other carcinogenic, mutagenic, reprotoxic (CMR) substances of category 1A or 1B that are not on the *candidate list*, above 0.1 by weight % in at least one sub-product: no.

Biocidal products have been added to this building product or it has been treated with biocidal products (this refers to treated goods within the meaning of the *Biocidal Products Regulation (EU) No. 528/2012*): yes.

The Sanitized® antibacterial treatment on the Nuance panels is free from nanoparticles. It contains a biocide whose active ingredient is silver phosphate glass which complies with the *REACH* and *European Biocidal Products regulations (EU) No. 528/2012*.

2.6 Manufacture

1. PUR calendar press: gluing of HPL on 2 sides on water-resistant composite board with PUR water-resistant glue

2. Postforming of HPL for panels with round edge

3. Profiling Tongue and groove and edge

4. Unit packaging

The Quality management system is certified: *ISO 9001*.

2.7 Environment and health during manufacturing

The production conditions do not demand any special health protection measures over and beyond the legal requirements.

Air: the constitutional valid regulations are observed. The emissions into the air are below the legally required thresholds.

Water: The process doesn't use or reject water.

Soil: There is no impact on soil.

The Environmental management system is certified: *ISO 14001*.

2.8 Product processing/Installation

Nuance panels can be cut using woodworking tools with carbide-tipped blades and bits.

Follow all the usual health and safety precautions when processing these panels about weight, dust and sharp edges.

Use appropriate personal protective equipment.
The dust produced by processing technical panelling solutions may irritate the skin or lungs, so use a dust collector whenever cutting wood and wear appropriate personal protective equipment.

The assembly of the panels is done by gluing with Complete adhesive.

For new builds, the panels can be bonded directly on moisture-resistant plasterboard by waterproofing the substrate and applying a primer.

For renovation, the panels can be bonded directly on tiling or paintwork after carefully checking and waterproofing the substrate and sealing treatment.

The correct preparation of the substrate (flatness, waterproofing...) is key and detailed in the processing brochure. The assembly is done thanks to the tongue and groove system and the coloured connection joint Complete provides a seamless joint.

Detailed information and processing are available at www.polyrey.com

2.9 Packaging

Nuance panels are delivered unit-packed, and edge-protected using cardboard.

Cardboard can be recycled materially or energetically.

Pallets are used for the delivery. The pallets can be reused.

2.10 Condition of use

The composition during the use phase refers to the composition during the manufacturing.

Core and HPL panels are chemically inert and the bonding agents are chemically stable and permanently bonded to the core.

2.11 Environment and health during use

Environmental protection:

When the described products are used properly in accordance with the area of application, there is no risk of water, air, or ground contamination according to the current state of knowledge.

Health protection:

When used normally and in accordance with the intended purpose, no health risks or restrictions are to be anticipated with Nuance panels.

Except for minor amounts of formaldehyde in quantities that are harmless to health, no emissions of hazardous substances can be detected.

VOC emissions are measured for A ratings in tests on walls

with a loading factor of 1.0 m²/m³.

This is in line with the current state of knowledge.

2.12 Reference service life

The estimated service life of Nuance panel depends on the area of application (private or commercial use), the users themselves and the maintenance of the product. According to the Federal Office for Building and Regional Planning (*BBSR*) a reference service life of 20 years can be assumed for laminate/plastic coverings. The use stage (module B2) is declared in this EPD for 20 years of usage assuming 50 % domestic and 50 % commercial level of use.

2.13 Extraordinary effects

Fire

Nuance panels are classified as E according to *EN13501-1* and M3 according to *NFP 92-501*.

Water

Nuance panels are designed for use in an interior fitting of bathrooms or wetroom walls.

When installed according to the technical guideline and using Complete adhesives and sealants, the water doesn't have any impact on the Nuance system.

No substances that can be hazardous to water are washed out.

Mechanical destruction

The surface of HPL of Nuance panels gives good performance regarding impact, according to *EN 438-3* specification. The application of Nuance panels is a vertical application for wall panelling in bathrooms and wetrooms therefore not subject to strong mechanical aggression.

Moreover in case of severe damage the damaged panels should be replaced.

No hazardous substances are released during mechanical destruction.

2.14 Re-use phase

Currently, there is no possible re-use or recycling option. The scenario for the end of life is a landfill.

2.15 Disposal

Waste from Nuance panels is classed according to the *European Waste Catalogue* under the six-digit waste code 20 03 01. It is defined as «mixed municipal waste» which can be disposed of as household or commercial waste.

2.16 Further information

Detailed information and recommendations are available on www.polyrey.com

3. LCA: Calculation rules

3.1 Declared Unit

This declaration refers to the declared unit of 1 m² of Nuance board. The weight of the product is 8.34 kg/m².

Declared unit and mass reference

Name	Value	Unit
Declared unit	1	m ²
Grammage	8.34	kg/m ²
Layer thickness	0.0117	m

3.2 System boundary

The type of EPD is cradle to gate with options. The additional modules are modules A4, A5, B1 and B2.

Considered product stages:

- Production of pre-products, extraction of energy carriers, raw material transportation, manufacture of product and packaging materials are declared in modules A1-A3.
Modules A1-A3 also include the manufacturing and supply of energy.
- The scenario for the transport of the product to the construction site is declared in module A4.
- The treatment of packaging materials at installation, installation auxiliaries as well as installation losses are declared in module A5.
- The use stage includes emissions occurring during the lifetime of the product (B1) as well as the maintenance stage/cleaning (B2).
- Two end-of-life scenarios are declared in the EPD. They include manual dismantling (C1), transportation to waste processing (C2),

- Scenario 1: 100 % thermal treatment with energy recovery (C3/1). Credits for electricity and thermal energy, which result from energy recovery in modules A5 and C3, are declared in module D/1.
- Scenario 2: 100 % landfilling (C4/2). Credits for electricity and thermal energy, which result from energy recovery in module A5, are declared in module D/2.
- The CO₂ incorporation in the product (from the sequestration in the paper material) is considered. The C-balance is closed by considering the biotic CO₂ emissions according to the incorporation on the input side.

3.3 Estimates and assumptions

The following assumptions are included in the EPD:

- It is assumed that packaging materials are disposed of via incineration (wooden pallets) and recycling (cardboard).
- Distance to the end of life of non-hazardous waste is assumed as 50km.

3.4 Cut-off criteria

The packaging of the raw materials, as well as their disposal, is not considered in the scope of this study.

Transportation of installation auxiliaries' materials is also not considered in the scope of this study.

3.5 Background data

The background data has been taken from the latest available *GaBi* database *CUP 2022.1*. The requirements for data quality and background data correspond to the specifications of the *PCR Part A*.

3.6 Data quality

The requirements on the data quality and the background data correspond to the provisions in *EN 15804* and the *IBU PCR part A* (IBU 2020) respectively:

- All primary data are collected for the year 2021. All secondary data come from the *GaBi* databases and are representative of the years 2017-2022. As the study intended to compare the product systems for the reference year 2021, temporal representativeness is good.
- All primary and secondary data are collected specific to the countries/regions under study.

Where country/region-specific data are unavailable, proxy data are used. The overall geographical representativeness is considered to be good.

- All primary and secondary data are modelled to be specific to the technologies or technology mixes under study. Where technology-specific data is unavailable, proxy data are used. The overall technological representativeness is considered to be good.
- Primary data are collected by the client using a specifically adapted spreadsheet. *Sphera* supported the data collection by preparing a specific questionnaire and virtual or onsite support.

Overall, the data quality can be described as good. The primary data collection has been done thoroughly; all relevant flows are considered.

3.7 Period under review

The period under review for the collection of production data is the year 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

The production process does not deliver any co-products. The applied software model does not contain any allocation.

The overall production of Wilsonart comprises further products besides the products considered in this study. Data for electrical energy refers to the declared product. During data collection, the allocation is done via quantities (mass) produced.

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. Background dataset: *GaBi ts software, CUP 2022.1*.

4. LCA: Scenarios and additional technical information

Characteristic product properties

Information on biogenic carbon

Biogenic carbon is present in the product and the packaging materials.

Note: 1 kg biogenic Carbon is equivalent to 44/12 kg of CO₂

Information on describing the biogenic Carbon Content at factory gate

Name	Value	Unit
Biogenic carbon content in product	0.66	kg C
Biogenic carbon content in accompanying packaging	0.66	kg C

The following technical information is a basis for the declared modules.

Transport to the building site (A4)

Module A4 considers a 600 km truck transport from the manufacturing plant in the UK to an average European customer site.

Name	Value	Unit
Litres of fuel (truck Euro 6)	0.013	l/100km
Transport distance	600	km
Capacity utilisation (including empty runs)	61	%

Installation into the building (A5)

The installation of the Nuance board is done manually with some electric tools (e.g. cutting saw). Adhesive and sealant are needed for the installation.

Installation losses have been accounted for in module A5. Product losses have been considered as 15 %. Losses are disposed of in a landfill. The packaging material treatment and disposal are also

considered in module A5.

Name	Value	Unit
Auxiliary (adhesive and sealant)	0.18	kg
Electricity consumption (for cutting)	0.06	kWh
Material loss (15 %)	1.25	kg
Output substances following waste treatment on site (packaging materials)	1.605	kg

Packaging material:

Cardboard: 0,105 kg/m²

Wood pallets: 1,5 kg/m²

Use (B1)

Emissions to air occur during the use stage of the product. The following emissions are considered in module B1.

Name	Value	Unit
Formaldehyde emissions (for the RSL)	1,60E-08	kg/m ²
VOC emissions (for the RSL)	7,5E-09	kg/m ²

Maintenance (B2)

Module B2 includes the cleaning of the board. Water and detergent are required for the cleaning. The scenario considers installation in the following conditions: 50 % residential (1 cleaning/week) and 50 % hotel (1 cleaning/day - 70 % load). This results in 154 cleanings per year. The following table documents the water and auxiliaries consumption for the cleaning of 1 m² per year.

Name	Value	Unit
Water consumption	0.0077	m ³
Auxiliary (detergent)	0.123	kg

The estimated service life of Nuance panels depends on the area of application (private or commercial use), the users

themselves and the maintenance of the product. According to BBSR a reference service life of 20 years can be assumed for laminate/plastic coverings. The use stage (module B2) is declared in this EPD for 20 years of usage assuming 50 % domestic and 50 % commercial level of use.

Reference service life

Name	Value	Unit
Life Span according to the manufacturer	20	a

End of life (C1-C4)

The deconstruction (module C1) is assumed to be done manually (no environmental impact).

The transport to waste processing (module C2) is assumed to be 50 km.

Scenario 1 : Thermal treatment with energy recovery (C3/1)

Scenario 2 : Landfilling (C4/2)

Name	Value	Unit
Collected as mixed construction waste	8.34	kg
Landfilling (Scenario 1)	8.34	kg
Energy recovery (Scenario 2)	8.34	kg

Reuse, recovery and/or recycling potentials (D)

Module D/1 includes the potential benefits in form of energy recovery of the incineration process in A5 (incineration of packaging wastes) and C4 (combustion of the product).

Module D/2 includes the potential benefits in form of energy recovery of the incineration process in A5 (incineration of packaging wastes).

5. LCA: Results

The following tables display the environmentally relevant results according to EN 15804+A2 for 1 m² Nuance board.

Two end-of-life scenarios are declared in the EPD:

C3/1: 100 % thermal treatment of the product with energy recovery

D/1: benefits in form of energy recovery of the incineration process in A5 (incineration of packaging wastes) and C4 (combustion of the product).

C4/2: 100 % landfilling

D/2: benefits in form of energy recovery of the incineration process in A5 (incineration of packaging wastes).

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	X	X	MNR	MNR	MNR	MND	MND	X	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 m² Nuance board

Parameter	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3/1	C3/2	C4/1	C4/2	D/1	D/2
GWP-total	kg CO ₂ eq	4.3E+01	4.55E-01	1.23E+01	0	1.96E+00	0	3.25E-02	1.84E+01	0	0	5.39E+00	-5.02E+00	-9.51E-01
GWP-fossil	kg CO ₂ eq	4.77E+01	4.5E-01	1.02E+01	0	1.87E+00	0	3.22E-02	1.6E+01	0	0	2.7E-01	-4.81E+00	-7.58E-01
GWP-biogenic	kg CO ₂ eq	-4.75E+00	1.89E-03	2.05E+00	0	9.48E-02	0	1.35E-04	2.42E+00	0	0	5.11E+00	-2.11E-01	-1.93E-01
GWP-luluc	kg CO ₂ eq	3.36E-02	3.09E-03	5.82E-03	0	1.12E-03	0	2.2E-04	1.25E-03	0	0	2.51E-04	-5.06E-04	-8.02E-05
ODP	kg CFC11 eq	2.48E-09	4.5E-14	3.77E-10	0	5.21E-13	0	3.21E-15	1.57E-11	0	0	4.41E-13	-3.5E-11	-5.55E-12
AP	mol H ⁺ eq	1.56E-01	5.12E-04	2.54E-02	0	8.4E-03	0	3.65E-05	5E-03	0	0	1.67E-03	-6.11E-03	-9.66E-04
EP-freshwater	kg P eq	1.17E-04	1.64E-06	1.94E-05	0	1.04E-04	0	1.17E-07	4.02E-06	0	0	7.69E-06	-6.98E-06	-1.11E-06
EP-marine	kg N eq	4.08E-02	1.65E-04	6.72E-03	0	1.77E-03	0	1.18E-05	1.67E-03	0	0	6.01E-04	-1.6E-03	-2.52E-04
EP-terrestrial	mol N eq	4.19E-01	1.97E-03	7.02E-02	0	1.53E-02	0	1.41E-04	2.08E-02	0	0	5.78E-03	-1.7E-02	-2.69E-03
POCP	kg NMVOC eq	1.14E-01	4.41E-04	1.97E-02	2.15E-08	4.98E-03	0	3.15E-05	4.75E-03	0	0	3.04E-03	-4.34E-03	-6.85E-04
ADPE	kg Sb eq	2.31E-05	4.62E-08	3.97E-06	0	3.67E-06	0	3.3E-09	3.85E-07	0	0	2.1E-08	-6.52E-07	-1.03E-07
ADPF	MJ	6.61E+02	6.01E+00	1.19E+02	0	5.11E+01	0	4.29E-01	2.95E+01	0	0	3.58E+00	-4.34E+01	-6.88E+00
WDP	m ³ world eq deprived	6.7E+00	5.13E-03	1.51E+00	0	6.34E-01	0	3.66E-04	1.65E+00	0	0	2.94E-02	-5.45E-01	-8.65E-02

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 Nuance board

Parameter	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3/1	C3/2	C4/1	C4/2	D/1	D/2
PERE	MJ	1.34E+02	4.17E-01	5.3E+01	0	1.85E+00	0	2.98E-02	2.72E+01	0	0	3.76E-01	-2.41E+01	-3.82E+00
PERM	MJ	4.35E+01	0	-2.4E+01	0	0	0	0	-1.94E+01	0	0	0	0	0
PERT	MJ	1.78E+02	4.17E-01	2.89E+01	0	1.85E+00	0	2.98E-02	7.81E+00	0	0	3.76E-01	-2.41E+01	-3.82E+00
PENRE	MJ	5.68E+02	6.04E+00	1.19E+02	0	5.11E+01	0	4.31E-01	1.23E+02	0	0	3.58E+00	-4.34E+01	-6.88E+00
PENRM	MJ	9.36E+01	0	0	0	0	0	0	-9.36E+01	0	0	0	0	0
PENRT	MJ	6.61E+02	6.04E+00	1.19E+02	0	5.11E+01	0	4.31E-01	2.95E+01	0	0	3.58E+00	-4.34E+01	-6.88E+00
SM	kg	1.28E+00	0	1.92E-01	0	0	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0
FW	m ³	1.98E-01	4.82E-04	4.39E-02	0	1.49E-02	0	3.44E-05	4.2E-02	0	0	8.26E-04	-2.3E-02	-3.64E-03

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;

RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2:

1 m² Nuance board

Parameter	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3/1	C3/2	C4/1	C4/2	D/1	D/2
HWD	kg	1.86E-05	3.19E-11	2.79E-06	0	1.7E-04	0	2.28E-12	2.31E-09	0	0	4.28E-10	-3.76E-09	-5.95E-10
NHWD	kg	7.77E-01	9.84E-04	1.63E+00	0	1.62E-01	0	7.02E-05	9.9E+00	0	0	8.52E+00	-3.27E-02	-5.18E-03
RWD	kg	2.21E-02	1.12E-05	3.67E-03	0	7.93E-04	0	8E-07	9.53E-04	0	0	4.26E-05	-6.94E-03	-1.1E-03
CRU	kg	0	0	0	0	0	0	0	0	0	0	0	0	0
MFR	kg	1.22E-02	0	1.07E-01	0	0	0	0	0	0	0	0	0	0
MER	kg	0	0	0	0	0	0	0	0	0	0	0	0	0
EEE	MJ	0	0	5.78E+00	0	0	0	0	1.71E+01	0	0	0	0	0
EET	MJ	0	0	1.04E+01	0	0	0	0	3.11E+01	0	0	0	0	0

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 Nuance board

Parameter	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3/1	C3/2	C4/1	C4/2	D/1	D/2
PM	Disease incidence	2.64E-06	3.52E-09	4.21E-07	0	6.24E-08	0	2.51E-10	1.1E-07	0	0	1.78E-08	-4.96E-08	-7.85E-09
IR	kBq U235 eq	2.24E+00	1.69E-03	3.8E-01	0	1.3E-01	0	1.21E-04	1.08E-01	0	0	5.8E-03	-1.18E+00	-1.86E-01
ETP-fw	CTUe	2.07E+02	4.26E+00	4.33E+01	2.94E-06	7.32E+01	0	3.04E-01	2.44E+01	0	0	1.75E+00	-1.9E+01	-3.01E+00
HTP-c	CTUh	7.17E-08	8.78E-11	1.13E-08	2.11E-13	9.85E-10	0	6.27E-12	9.78E-10	0	0	2.07E-10	-7.66E-10	-1.21E-10
HTP-nc	CTUh	9.07E-06	4.77E-09	1.41E-06	3.08E-15	7.73E-08	0	3.4E-10	1.03E-07	0	0	2.59E-08	-2.07E-08	-3.28E-09
SQP	SQP	8.86E+02	2.55E+00	1.36E+02	0	9.97E-01	0	1.82E-01	6.81E+00	0	0	4.21E-01	-1.56E+01	-2.48E+00

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

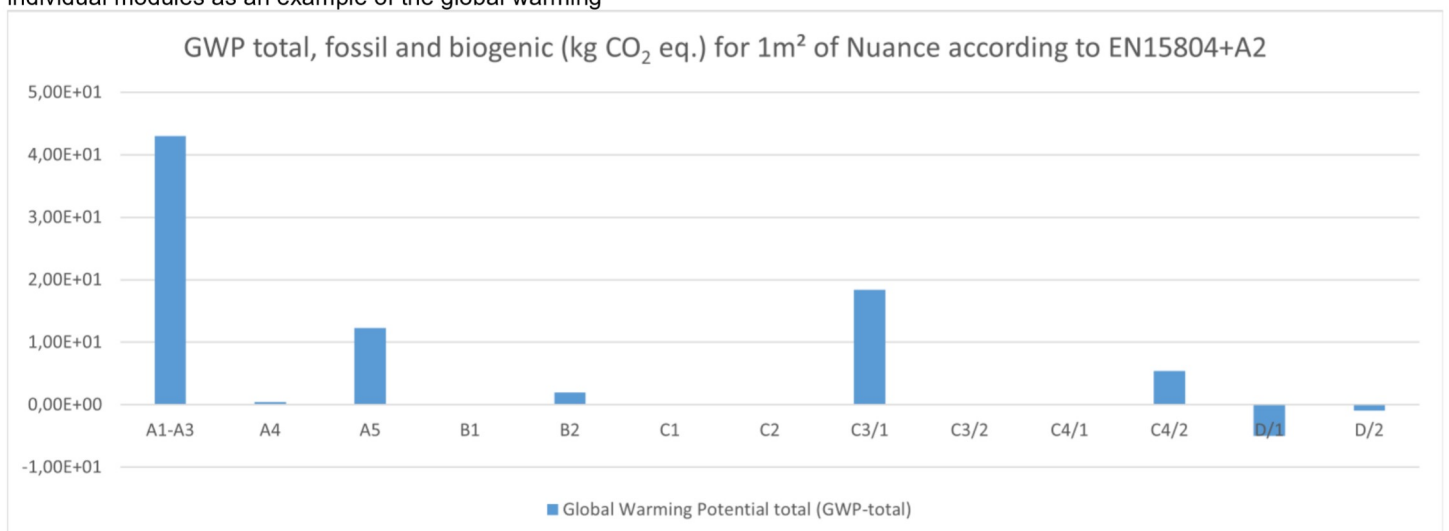
Disclaimer 1 – for the indicator 'Potential Human exposure efficiency relative to U235'. This impact category deals mainly with the eventual impact of low-dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure or radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, 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 as there is limited experience with the indicator.

6. LCA: Interpretation

The interpretation is based on the assumptions and limitations described in the background report, both with regard to the methods and the data. A dominance analysis is used for interpretation. The following figure shows the results of the individual modules as an example of the global warming

potential.



It is visible that the manufacturing phase dominates the product system. In addition, the packaging treatment in module A5 has

relevant environmental impacts.

The C3/1 module (incineration scenario) is the second highest contributor to the GWP impact, due to combustion emissions. The GWP impact in the C4/2 module (landfilling scenario) is mostly due to the release of the biogenic carbon stored in the HPL as both carbon dioxide and methane. Results for module B2 are declared for the RSL of 20 years.

Interpretation of results for the environmental indicators according to ISO 14044:

- Production of the composite board (a major component of the Nuance product) has a significant influence (>50 %) on nearly all indicators. It represents more than 75 % of the impacts in the GWP-total, ODP, ADPE and water use indicators.
- The GWP-biogenic is shared by the HPL production and the packaging materials (wood pallets and cardboard) due to the carbon sequestered in the materials.
- Transportation of raw materials has a relevant influence (between 25 % and 50 %) to the AP, EP-marine, EP-terrestrial and POCP indicators.
- The production process and energy consumption comparatively have minor impacts overall.

7. Requisite evidence

VOC and formaldehyde emissions

Determination of the VOC and formaldehyde emission according to/compliance with AgBB-Scheme / ISO 16000 part 3, 6 and 9

Measurement centre: Eurofins Product Testing A/S-Smedeskovvej 38 -8464 Galten - Denmark

Test report: 392-2019-00131801-A-EN-03 of 02.04.2019

Result:

A rating according to the regulation of March and May 2011 - tested according to a wall scenario with a loading factor of 1.0 m²/m³

Formaldehyde E1 class - formaldehyde result based on chamber testing and DNPH sampling according to ISO 16000. The result is therefore not directly according to EN 717-1, and there are a few small deviations. The testing is in accordance with the conclusions presented in CEN TC351 WG2 N174 where the difference and compatibility between EN 717-1 and

ISO 16000 are empirically and theoretically analysed.

AgBB overview of results (28 days [µg/m³])

Name	Value	Unit
TVOC (C6 - C16)	10	µg/m ³
Sum SVOC (C16 - C22)	< 5	µg/m ³
R (dimensionless)	170	-
VOC without NIK	< 5	µg/m ³
Carcinogenic Substances	< 1	µg/m ³
Formaldehyde	16	µg/m ³

AgBB overview of results (3 days [µg/m³])

Name	Value	Unit
TVOC (C6 - C16)	20	µg/m ³
Sum SVOC (C16 - C22)	< 5	µg/m ³
R (dimensionless)	250	-
VOC without NIK	< 5	µg/m ³
Carcinogenic Substances	< 1	µg/m ³

8. References

Standards

EN 438 : High-pressure decorative laminates (HPL) - Sheets based on thermosetting resins (usually called laminates)

EN438-2:2016 : Part 2: Determination of properties
EN438-3:2016: Part 3 : classification and specifications for laminates less than 2 mm thick intended for bonding to supporting substrates
EN438-7 : 2005 :Part 7: Compact laminate and HPL composite panels for internal and external wall and ceiling finishes

EN 717-1

EN 717-1: 2004:Wood-based panels. Determination of formaldehyde release Formaldehyde emission by the chamber method

EN 13501-1

EN13501-1: Fire classification of construction products and building elements -
Part 1 : classification using data from reaction to fire tests

EN 15804

EN15804:2012+A2:2019+AC:2021, Sustainability of construction works —Environmental Product Declarations — Core rules for the product category of construction products.

ISO 9001

ISO 9001: 2015: Quality Management System

ISO 13894

ISO 13894 : High-pressure decorative laminate - Composite elements - Part 1 : test methods - part 2 : specifications

ISO 14001

ISO 14001: 2015: Environmental Management System

ISO 14025

EN ISO 14025:2011, Environmental labels and declarations — Type III environmental declarations — Principles and procedures.

ISO 16000

ISO 16000: Indoor air - Part 3 : determination of formaldehyde - Part 6 :
determination of organic compounds - Part 9 : determination of the emission of volatile organic compounds from building products and furnishing - Emission test chamber method

NFP 92-501

NFP 92-501 : Safety against fire - Building materials - Reaction to fire tests

Further References

BBSR

BBSR table (german): 'Nutzungsdauern von Bauteilen zur Lebenszyklusanalyse nach BNB', Bundesinstitut für Bau-, Stadt- und Raumforschung, Referat II Nachhaltiges Bauen; online available under https://www.nachhaltigesbauen.de/austausch/nutzungsdauern_von_auteilen/

BPR

BPR : Biocidal Products
Regulation (BPR) refers to Regulation (EU) 528/2012 concerning the placing on the market and use of biocidal products.

GaBi

GaBi Software System and Database for Life Cycle Engineering, 1992-2021, Sphaera Solutions GmbH, Leinfelden-Echterdingen, with acknowledgement of LBP University of Stuttgart, program version GaBi 10; database version 2022.1

GaBi documentation

GaBi dataset documentation for the software system and databases, LBP, University of Stuttgart and Sphaera Solutions GmbH, Leinfelden-Echterdingen, 2021.
([http://www.gabi-software.com/support/gabi/gabi\[1\]database-2021-lci-documentation/](http://www.gabi-software.com/support/gabi/gabi[1]database-2021-lci-documentation/))

IBU 2021

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

PCR Part A

PCR - Part A: Calculation rules for the Life Cycle Assessment and Requirements on the Background Report, version 1.6, Institut Bauen und Umwelt e.V., www.bau-umwelt.com, 2017

PCR Part B

Part B: Requirements on the EPD for Decorative board for interior use , 09/2022

REACH

Regulation (EC) No 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)

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

European Waste Catalogue

Guidance on Classification of Waste according to EWC-stat categories version 2, December 2010

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