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DECORA SPC FLOOR

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ITB is the verified member of The European Platform for EPD program operators and LCA practitioner www.eco-platform.org

BASIC INFORMATION

This declaration is the Type III Environmental Product Declaration (EPD) based on EN 15804 and verified according to ISO 14025 by an external auditor. It contains the information on the impacts of the declared construction materials on the environment. Their aspects were verified by the independent body according to ISO 14025. Basically, a comparison or evaluation of EPD data is possible only if all the compared data were created according to EN 15804 (see point 5.3 of the standard).

Life cycle analysis (LCA): A1-A3, C1-C4 and D modules, in accordance with EN 15804

(Cradle to Gate with options)

The year of preparing the EPD: 2023

Product standard: EN 14041

Service Life: 50 years, SL shall vary depending on a specific scenario of application

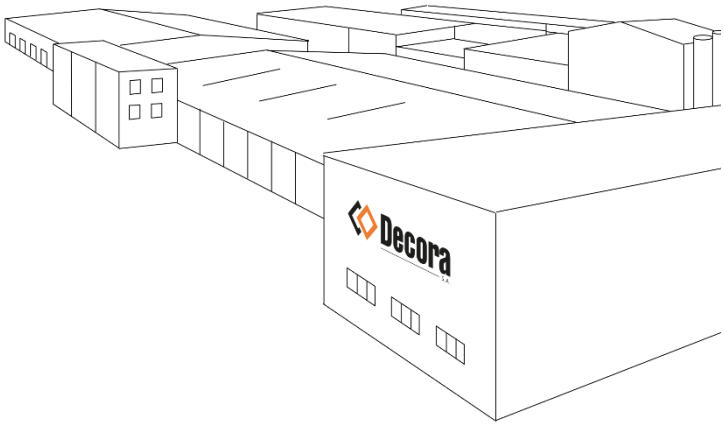
PCR: ITB-PCR A (PCR based on EN 15804)

Declared unit: 1 m^2, from 2.5 mm to 5,0mm thickness

Reasons for performing LCA: B2B

Representativeness: manufactured in Poland, year 2022

BASIC INFORMATION



Decora S.A. is an international production company with a manufacturing plant located in Środa Wielkopolska (Poland). Decora was one of the first companies in Europe to introduce a new flooring category SPC – vinyl flooring, with a high-density mineral core developed by the company. The product is 100 % waterproof, ideal for underfloor heating. In 2022, Decora started flooring production plant in Poland. Now, as the only manufacturer in Europe, it offers underlays, skirting boards and floor profiles from own local production. The company sells its products on 5 continents, although it focuses on EU markets. The company has implemented a zero-waste policy.

PRODUCTS DESCRIPTION

This environmental declaration type III covers products from the DECORA SPC FLOOR group. The SPC Floor Coverings covered by this environmental declaration is waterproof flooring, which represents the new generation of SPC (Stone Plastic Composite), for use in domestic and commercial areas. The core of SPC Floor Coverings is made with PVC, chalk, and recycled content, finished with a decorative layer and covered with high-quality UV varnish. The products are manufactured in four basic thicknesses (Table 1) . All products have a set of tests in accordance with the EN standards.

Table 1. Products covered by EPD no 457/2023

Decora SPC floor 2,5 mm (4.86 kg/m^2)	L: 616~1518mm W: 154mm~236mm
Decora SPC floor 4,0 mm (8.08-8.29 kg/m^2)	L: 610~1220mm W: 180mm~457mm
Decora SPC floor 4,5 mm (9.16 kg/m^2)	L: 592mm W: 148mm
Decora SPC floor 5,0 mm (10.24 kg/m^2)	L: 592mm~2180mm W: 148mm~229mm

All specific product technical data is available at manufacturer website.(https://decora.pl/)

The products may be available under the Decora brands.

Decora brands:

Arbiton FLOOR EXPERT | AFIRMAX | FLOORNITY floor for life

LIFE CYCLE ASSESSMENT (LCA) – GENERAL RULES APPLIED

Declared Unit

1 m^2, vinyl flooring with a high-density mineral core, 2.5 mm to– 5.0mm thickness.

System boundary

The life cycle analysis of the declared product covers “Product Stage” A1-A3, C1-C4+D modules in accordance with EN 15804 and ITB PCR A (cradle to gate with options).

Allocation

The allocation rules used for this EPD are based on general ITB PCR A. The EPD is representative for all SPC products (production impacts are allocated the same way, mass based). Allocation covers 100% of production. In collaborative processes (all products), e.g. energy consumption for a production hall or offices, impacts were allocated on the basis of total mass allocation.

System limits

Minimum 99.5% input materials and 100% energy consumption (electricity, gas) were inventoried in manufacturing plant and were included in the calculation. In the assessment, all significant parameters from gathered production data are considered, i.e. all material used per formulation, utilized thermal energy, and electric power consumption, direct production waste and available emission measurements. Tires consumption for transport was not taken into account. Limited number of substances with a percentage share of less than 0.1% of total mass might be excluded from the calculations. It is assumed that the total sum of omitted processes does not exceed 1% of all impact categories. Wooden packaging products are excluded in the analysis (considered as closed loop products). In accordance with EN 15804 machines and facilities required for and during production are excluded, as is transportation of employees.

A1 and A2 Modules: Raw materials supply and transport

All resource products (used for a production) were inventoried. A vast majority of components necessary for chemical reactions are sourced from foreign chemical production suppliers (not providing specific impacts) so the general data for these product was used in LCA. The transport to the factory has been fully inventoried (LCI questionnaire) considering the number of deliveries: type of vehicles, the size of the delivery and the distance from the manufacturer to the factory for all input sources and raw materials. Packing (e.g. wooden pallets) circulates almost in a closed cycle (therefore it is not included in LCA). For A2 calculation purposes, manufactured inventory data is analyzed and European averages for fuel data are applied.

A3: Production

The SPC floor production process starts with the preparation of the SPC mixture in the hot/cold mixer. Poly(vinyl chloride) (PVC), calcium carbonate (chalk), recycled material, thermal stabilizers, impact modifiers, flow modifiers and some lubricants are dosed in the appropriate amounts to the mixer. After dosing all the ingredients, the mixing process begins and the materials are heated to the 125 ^{O}C. and then SPC mixture is transported to the buffer silo from which it is fed to the extruder. In the extruder, under the high temperature and the screw movement, the mixture undergoes the gelation process and it is formed into the appropriate board shape in the die. Next, the SPC core passes through the calender system where the decorative and wear layer films are put on the top of the SPC board. Then, the whole board undergoes the process of impressing the appropriate structure by the embossing roller. At the end of the line, the SPC extruded board is evenly cooled and cut to the correct dimensions. In the next step, prepared SPC boards are subjected to

the UV-lacquering process in which the surface of the board is covered with the special UV lacquer layer. The last process of the production takes place on the milling machines. Firstly, the boards are cut to the raw panels and then, the locking systems are milled at each side of the panel. Prepared panels are then packed into the carton boxes and placed on the pallets. Finally, the products are loaded on trucks and delivered to the customer.

Fig.1. SPC FLOOR production process (A3)

End of life scenarios (C and D modules)

The end-of-life scenario for all products has been generalized based on actual state of the art. It is assumed that in the end of life stage (C1), some electric/mechanical energy is needed to remove products from installation place, the transport distance for waste to waste processing (C2) is 100 km on > 10t loaded lorry with 75% capacity utilization and fuel consumption of 20 l per 100 km. At the end of life, the floors are dismantled and the materials recycled according to the national treatment practice of waste what is presented in Table 1. It is assumed that 20% of the product can be recovered in the recycling process. The remaining 40% may be designated for incineration and the remaining 40% for landfill. The reuse, recovery and recycling stage are considered beyond the system boundaries (D) (reuse potential and incineration – gained heat). The end of life scenario for SPC Floor is provided in Table 2.

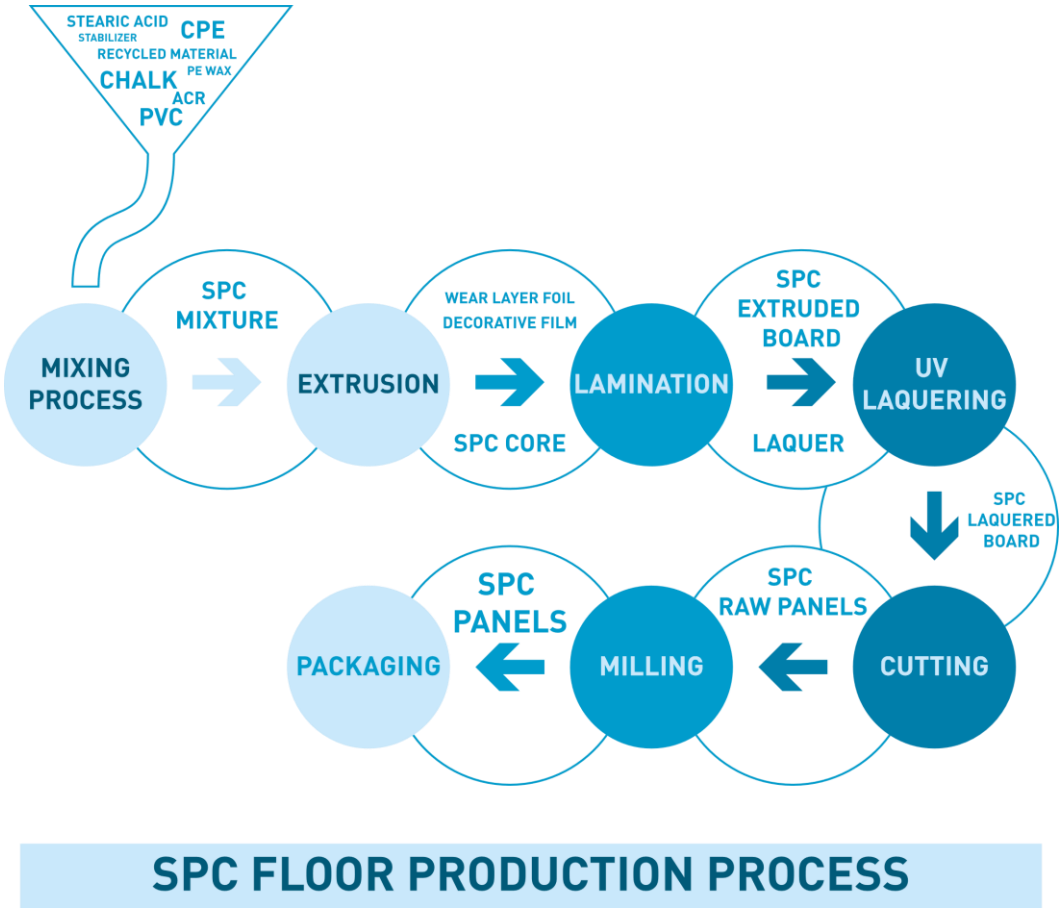


Table 2. End-of-life scenario (C modules) for SPC Floors

Parameter	Contribution
Collection rate	100%
Recycling	20%
Incineration	40%
Landfilling	40%

Electricity at end-of-life (module C) has been modelled using an average Polish electricity mix as the location where the product reaches end-of-life is unknown.

Data collection period

The data for manufacture of the declared products refer to period between 01.01.2022 – 31.12.2022 (1 year). The life cycle assessments were done for Poland as reference area.

Calculation rules

LCA was done in accordance with ITB PCR a document. Characterization factors are CML ver. 4.2 based.

ITB-LCA algorithms were used for impact calculations. A1 was calculated based on data from the database, A2 and A3 are calculated based on the LCI questionnaire provided by the manufacturer. Emission of greenhouse gases was calculated using the IPCC 2013 GWP method with a 100-year horizon. Emission of acidifying substances, Emission of substances to water contributing to oxygen depletion, Emission of gases that contribute to the creation of ground-level ozone, Abiotic depletion, and ozone depletion emissions where all calculated with the CML-IA baseline method.

Data quality - production

The values determined to calculate A1-A3 originate from verified process LCI inventory data form production plant. A1 values for inputs (PVC, Chalk, were prepared considering input products characteristics based on Eco invent data. The energy consumption of production and its impact on the production lines were separately inventoried and calculated. In accordance with Annex E of the EN 15804 + A2, a data quality assessment was performed with a quality level of " good".

Assumptions and estimates

According to the data adopted from the Ecoinvent 3.9 database, the post-consumer scrap/recycled content is not burdened with the environmental impacts.

Databases

The data selected for LCA originate from ITB-LCI questionnaire completed by producer and verified via data audit. No data collected is older than five years and no generic datasets used are older than ten years. The representativeness, completeness, reliability, and consistency are judged as good. The background data for the processes come from the following resources database Ecoinvent v.3.9 (energy carriers, PVC, calcium carbonate, additives, waste treatment, incineration, and packaging). The background data for energy is national based on KOBiZE reports (Polish electricity mix and combustion factors for fuels). Specific (LCI) data quality analysis was a part of the input data verification. Where no background data was available, data gaps were complemented by literature research the time related quality of the data used is valid (5 years).

Additional information

Polish electricity mix used is 0.698 kg CO_2/kWh (KOBiZE, 2021). The product is the Blauer Engel ecolabeled. No damage to health or impairment is expected under normal use corresponding to the intended use of the product. The product contains up to 25% of recycled material.

LIFE CYCLE ASSESSMENT (LCA) – RESULTS

Declared unit

The declaration refers to the declared unit DU – 1 m^2 of SPC Floor. The following life cycle modules are included in the declaration (Table 3). Tables 4-19 provide the environmental impacts of 1 m^2 of product with specific thickness (2.5mm - 5.0 mm).

Table 3. System boundaries (life stage modules included) in a product environmental assessment

Environmental assessment information (MA – Module assessed, MNA – Module not assessed, INA – Indicator Not Assessed)																
Product stage			Construction process		Use stage							End of life				Benefits and loads beyond the system boundary
Raw material supply	Transport	Manufacturing	Transport to construction site	Construction-installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction 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**
MA	**MA**	**MA**	**MNA**	**MNA**	**MNA**	**MNA**	**MNA**	**MNA**	**MNA**	**MNA**	**MNA**	**MA**	**MA**	**MA**	**MA**	**MA**

Table 4. Life cycle assessment (LCA) results for SPC Floor– the environmental impacts (DU: 1 m^2; 2.5 mm)

Indicator	Unit	A1	A2	A3	C1	C2	C3	C4	D
Global Warming Potential	eq. kg CO_2	4.22E+00	1.81E+00	1.91E+00	2.71E-01	9.13E-02	5.31E+00	2.07E-02	-2.95E+00
Greenhouse gas potential - fossil	eq. kg CO_2	4.39E+00	1.80E+00	1.86E+00	2.66E-01	9.09E-02	5.31E+00	2.05E-02	-2.93E+00
Greenhouse gas potential - biogenic	eq. kg CO_2	-1.82E-01	9.19E-03	5.21E-02	7.78E-03	3.11E-04	2.83E-03	2.06E-04	-9.86E-03
Global warming potential - land use and land use change	eq. kg CO_2	7.69E-03	1.08E-03	6.28E-04	9.33E-05	3.57E-05	7.61E-05	2.07E-05	-2.39E-03
Stratospheric ozone depletion potential	eq. kg CFC 11	8.58E-07	3.93E-07	4.43E-08	5.44E-09	2.10E-08	7.74E-06	6.22E-09	-1.07E-06
Soil and water acidification potential	eq. mol H+	2.32E-02	7.02E-03	1.98E-02	2.95E-03	3.69E-04	1.09E-01	1.73E-04	-1.17E-02
Eutrophication potential - freshwater	eq. kg P	1.36E-03	1.76E-04	3.37E-03	5.05E-04	6.11E-06	1.37E-05	5.94E-06	-7.07E-04
Eutrophication potential - seawater	eq. kg N	4.15E-03	1.93E-03	2.88E-03	4.28E-04	1.11E-04	5.85E-02	5.96E-05	-2.40E-03
Eutrophication potential - terrestrial	eq. mol N	4.25E-02	1.93E-03	2.43E-02	3.62E-03	1.21E-03	6.24E-01	6.48E-04	-2.40E-02
Potential for photochemical ozone synthesis	eq. kg NMVOC	1.72E-02	6.56E-03	6.82E-03	1.01E-03	3.72E-04	1.54E-01	1.87E-04	-8.70E-03
Potential for depletion of abiotic resources - non-fossil resources	eq. kg Sb	2.02E-04	1.14E-05	8.72E-06	1.30E-06	3.22E-07	9.74E-07	6.93E-08	-2.92E-05
Abiotic depletion potential - fossil fuels	MJ	9.96E+01	2.63E+01	3.12E+01	4.51E+00	1.35E+00	5.10E-01	4.73E-01	-6.03E+01
Water deprivation potential	eq. m^3	2.60E+00	1.63E-01	6.26E-01	9.33E-02	6.24E-03	9.95E-02	2.75E-03	-1.17E+00

* The value of the carbon footprint of the product in the product stage A1 A3 is 7.94 kg CO2 /m^2

Table 5. Life cycle assessment (LCA) results for SPC Floor – the environmental aspects (DU: 1 m^2; 2.5 mm)

Indicator	Unit	A1	A2	A3	C1	C2	C3	C4	D
Consumption of renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	6.62E+00	5.69E-01	2.23E+00	3.34E-01	1.94E-02	1.64E-01	0.00E+00	-2.08E+00
Consumption of renewable primary energy resources used as raw materials	MJ	1.68E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total consumption of renewable primary energy resources	MJ	8.33E+00	5.69E-01	2.23E+00	3.34E-01	1.94E-02	1.64E-01	8.30E-03	-2.09E+00
Consumption of non-renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	6.04E+01	2.63E+01	3.02E+01	4.52E+00	1.35E+00	-1.03E+02	5.11E-01	-3.27E+01
Consumption of non-renewable primary energy resources used as raw materials	MJ	3.72E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.04E+02	0.00E+00	-2.09E+01
Total consumption of non-renewable primary energy resources	MJ	9.98E+01	2.63E+01	3.14E+01	4.52E+00	1.35E+00	5.11E-01	5.11E-01	-6.11E+01
Consumption of secondary materials	kg	1.17E-00	1.39E-02	2.93E-03	4.12E-04	4.52E-04	2.45E-03	0.00E+00	-9.76E-03
Consumption of renewable secondary fuels	MJ	7.17E-02	1.66E-04	1.56E-05	2.30E-06	4.99E-06	3.18E-05	0.00E+00	-9.60E-05
Consumption of non-renewable secondary fuels	MJ	0.00E+00	0.00E+00	2.43E-02	3.65E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net consumption of freshwater resources	m^3	1.33E-02	4.34E-03	1.32E-02	1.22E-03	1.70E-04	8.84E-04	7.38E-05	-2.09E-02

Table 6. Life cycle assessment (LCA) results for SPC Floor – the environmental impacts relate to waste management (DU: 1 m^2; 2.5 mm)

Indicator	Unit	A1	A2	A3	C1	C2	C3	C4	D
Hazardous waste, neutralized	kg	1.15E-01	4.18E-02	5.89E-03	4.67E-05	1.51E-03	9.25E-03	7.44E-07	-7.57E-02
Non-hazardous waste, neutralised	kg	5.25E+00	7.70E-01	3.63E-02	2.43E-03	2.69E-02	1.49E-01	1.95E+00	-2.98E+00
Radioactive waste	kg	8.66E-05	2.90E-06	2.29E-05	3.38E-06	1.01E-07	3.37E-06	2.87E-06	-4.12E-05
Materials for recycling	kg	1.40E-03	1.06E-04	4.99E-01	4.67E-06	4.18E-06	8.80E-01	0.00E+00	-7.75E-04
Materials for energy recovery	kg	5.97E-06	8.19E-07	4.34E-04	4.08E-08	3.38E-08	2.50E-07	0.00E+00	-2.27E-06
Exported energy	MJ	8.79E-02	0.00E+00	9.05E-02	1.35E-02	0.00E+00	1.13E+00	0.00E+00	-3.15E-02

Table7. Life cycle assessment (LCA) results for SPC Floor – the environmental additional information (DU: 1 m^2; 2.5 mm))

Indicator	Unit	A1	A2	A3	C1	C2	C3	C4	D
Particulate matter	disease incidence	INA	INA	INA	INA	INA	INA	INA	INA
Potential human exposure efficiency relative to U235	eg. kBq U235	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for ecosystems	CTUe	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for humans (cancer effects)	CTUh	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for humans (non-cancer effects)	CTUh	INA	INA	INA	INA	INA	INA	INA	INA
Potential soil quality index	dimensionless	INA	INA	INA	INA	INA	INA	INA	INA

Table 8. Life cycle assessment (LCA) results for SPC Floor– the environmental impacts (DU: 1 m^2; 4.0 mm)

Indicator	Unit	A1	A2	A3	C1	C2	C3	C4	D
Global Warming Potential	eq. kg CO_2	7.10E+00	3.05E+00	3.22E+00	4.57E-01	1.54E-01	8.95E+00	3.48E-02	-4.96E+00
Greenhouse gas potential - fossil	eq. kg CO_2	7.40E+00	3.04E+00	3.13E+00	4.48E-01	1.53E-01	8.94E+00	3.45E-02	-4.94E+00
Greenhouse gas potential - biogenic	eq. kg CO_2	-3.07E-01	1.55E-02	8.77E-02	1.31E-02	5.23E-04	4.77E-03	3.48E-04	-1.66E-02
Global warming potential - land use and land use change	eq. kg CO_2	1.30E-02	1.81E-03	1.06E-03	1.57E-04	6.01E-05	1.28E-04	3.49E-05	-4.02E-03
Stratospheric ozone depletion potential	eq. kg CFC 11	1.45E-06	6.62E-07	7.47E-08	9.17E-09	3.54E-08	1.30E-06	1.05E-08	-1.80E-06
Soil and water acidification potential	eq. mol H+	3.91E-02	1.18E-02	3.33E-02	4.98E-03	6.21E-04	1.83E-01	2.91E-04	-1.97E-02
Eutrophication potential - freshwater	eq. kg P	2.29E-03	2.96E-04	5.68E-03	8.51E-04	1.03E-05	2.31E-05	1.00E-05	-1.19E-03
Eutrophication potential - seawater	eq. kg N	6.98E-03	3.25E-03	4.84E-03	7.20E-04	1.88E-04	9.85E-02	1.00E-04	-4.05E-03
Eutrophication potential - terrestrial	eq. mol N	7.15E-02	3.25E-03	4.09E-02	6.09E-03	2.05E-03	1.05E+00	1.09E-03	-4.04E-02
Potential for photochemical ozone synthesis	eq. kg NMVOC	2.90E-02	1.11E-02	1.15E-02	1.70E-03	6.27E-04	2.60E-01	3.16E-04	-1.46E-02
Potential for depletion of abiotic resources - non-fossil resources	eq. kg Sb	3.40E-04	1.92E-05	1.47E-05	2.19E-06	5.43E-07	1.64E-06	1.17E-07	-4.91E-05
Abiotic depletion potential - fossil fuels	MJ	1.68E+02	4.44E+01	5.25E+01	7.60E+00	2.27E+00	8.60E-01	7.96E-01	-1.02E+02
Water deprivation potential	eq. m^3	4.38E+00	2.75E-01	1.05E+00	1.57E-01	1.05E-02	1.68E-01	4.62E-03	-1.96E+00

* The value of the carbon footprint of the product in the product stage A1 A3 is 13.37 kg CO_2/m^2

Table 9. Life cycle assessment (LCA) results for SPC Floor – the environmental aspects (DU: 1 m^2; 4.0 mm)

Indicator	Unit	A1	A2	A3	C1	C2	C3	C4	D
Consumption of renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	1.11E+01	9.58E-01	3.76E+00	5.63E-01	3.26E-02	2.77E-01	1.40E-02	-3.50E+00
Consumption of renewable primary energy resources used as raw materials	MJ	2.83E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total consumption of renewable primary energy resources	MJ	1.40E+01	9.58E-01	3.76E+00	5.63E-01	3.26E-02	2.77E-01	1.40E-02	-3.53E+00
Consumption of non-renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	1.02E+02	4.44E+01	5.08E+01	7.62E+00	2.27E+00	-1.74E+02	8.61E-01	-5.51E+01
Consumption of non-renewable primary energy resources used as raw materials	MJ	6.26E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.75E+02	0.00E+00	-3.52E+01
Total consumption of non-renewable primary energy resources	MJ	1.68E+02	4.44E+01	5.29E+01	7.62E+00	2.27E+00	8.60E-01	8.61E-01	-1.03E+02
Consumption of secondary materials	kg	1.96E+00	2.34E-02	4.94E-03	6.94E-04	7.62E-04	4.12E-03	0.00E+00	-1.64E-02
Consumption of renewable secondary fuels	MJ	1.21E-01	2.80E-04	2.62E-05	3.87E-06	8.40E-06	5.35E-05	0.00E+00	-1.62E-04
Consumption of non-renewable secondary fuels	MJ	0.00E+00	0.00E+00	4.10E-02	6.15E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net consumption of freshwater resources	m^3	2.24E-02	7.32E-03	2.22E-02	2.06E-03	2.86E-04	1.49E-03	1.24E-04	-3.53E-02

Table 10. Life cycle assessment (LCA) results for SPC Floor – the environmental impacts relate to waste management (DU: 1 m^2; 4.0 mm)

Indicator	Unit	A1	A2	A3	C1	C2	C3	C4	D
Hazardous waste, neutralized	kg	1.94E-01	7.04E-02	9.92E-03	7.86E-05	2.55E-03	1.56E-02	1.25E-06	-1.27E-01
Non-hazardous waste, neutralised	kg	8.85E+00	1.30E+00	6.11E-02	4.09E-03	4.53E-02	2.50E-01	3.28E+00	-5.01E+00
Radioactive waste	kg	1.46E-04	4.88E-06	3.86E-05	5.70E-06	1.70E-07	5.67E-06	4.84E-06	-6.94E-05
Materials for recycling	kg	2.37E-03	1.79E-04	8.40E-01	7.86E-06	7.04E-06	1.48E+00	0.00E+00	-1.30E-03
Materials for energy recovery	kg	1.01E-05	1.38E-06	7.31E-04	6.88E-08	5.69E-08	4.21E-07	0.00E+00	-3.82E-06
Exported energy	MJ	1.48E-01	0.00E+00	1.52E-01	2.27E-02	0.00E+00	1.91E+00	0.00E+00	-5.31E-02

Table 11. Life cycle assessment (LCA) results for SPC Floor – the environmental additional information (DU: 1 m^2; 4.0 mm)

Indicator	Unit	A1	A2	A3	C1	C2	C3	C4	D
Particulate matter	disease incidence	INA	INA	INA	INA	INA	INA	INA	INA
Potential human exposure efficiency relative to U235	eg. kBq U235	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for ecosystems	CTUe	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for humans (cancer effects)	CTUh	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for humans (non-cancer effects)	CTUh	INA	INA	INA	INA	INA	INA	INA	INA
Potential soil quality index	dimensionless	INA	INA	INA	INA	INA	INA	INA	INA

Table 12. Life cycle assessment (LCA) results for SPC Floor – the environmental impacts (DU: 1 m^2; 4.5 mm)

Indicator	Unit	A1	A2	A3	C1	C2	C3	C4	D
Global Warming Potential	eq. kg CO_2	7.95E+00	3.42E+00	3.60E+00	5.11E-01	1.72E-01	1.00E+01	3.90E-02	-5.55E+00
Greenhouse gas potential - fossil	eq. kg CO_2	8.28E+00	3.40E+00	3.50E+00	5.02E-01	1.71E-01	1.00E+01	3.86E-02	-5.53E+00
Greenhouse gas potential - biogenic	eq. kg CO_2	-3.44E-01	1.73E-02	9.81E-02	1.47E-02	5.86E-04	5.34E-03	3.89E-04	-1.86E-02
Global warming potential - land use and land use change	eq. kg CO_2	1.45E-02	2.03E-03	1.18E-03	1.76E-04	6.73E-05	1.43E-04	3.91E-05	-4.50E-03
Stratospheric ozone depletion potential	eq. kg CFC 11	1.62E-06	7.41E-07	8.35E-08	1.03E-08	3.97E-08	1.46E-06	1.17E-08	-2.02E-06
Soil and water acidification potential	eq. mol H+	4.37E-02	1.32E-02	3.73E-02	5.57E-03	6.95E-04	2.05E-01	3.25E-04	-2.21E-02
Eutrophication potential - freshwater	eq. kg P	2.56E-03	3.31E-04	6.35E-03	9.53E-04	1.15E-05	2.59E-05	1.12E-05	-1.33E-03
Eutrophication potential - seawater	eq. kg N	7.82E-03	3.64E-03	5.42E-03	8.06E-04	2.10E-04	1.10E-01	1.12E-04	-4.53E-03
Eutrophication potential - terrestrial	eq. mol N	8.00E-02	3.64E-03	4.58E-02	6.82E-03	2.29E-03	1.18E+00	1.22E-03	-4.52E-02
Potential for photochemical ozone synthesis	eq. kg NMVOC	3.25E-02	1.24E-02	1.29E-02	1.91E-03	7.01E-04	2.91E-01	3.53E-04	-1.64E-02
Potential for depletion of abiotic resources - non-fossil resources	eq. kg Sb	3.80E-04	2.15E-05	1.64E-05	2.45E-06	6.07E-07	1.84E-06	1.31E-07	-5.50E-05
Abiotic depletion potential - fossil fuels	MJ	1.88E+02	4.96E+01	5.88E+01	8.50E+00	2.54E+00	9.62E-01	8.91E-01	-1.14E+02
Water deprivation potential	eq. m^3	4.90E+00	3.08E-01	1.18E+00	1.76E-01	1.18E-02	1.88E-01	5.18E-03	-2.20E+00

* The value of the carbon footprint of the product in the product stage A1 A3 is 14.97 kg CO_2/m^2

Table 13. Life cycle assessment (LCA) results for SPC Floor – the environmental aspects (DU: 1 m^2; 4.5 mm)

Indicator	Unit	A1	A2	A3	C1	C2	C3	C4	D
Consumption of renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	1.25E+01	1.07E+00	4.21E+00	6.30E-01	3.65E-02	3.10E-01	1.56E-02	-3.92E+00
Consumption of renewable primary energy resources used as raw materials	MJ	3.17E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total consumption of renewable primary energy resources	MJ	1.57E+01	1.07E+00	4.21E+00	6.30E-01	3.65E-02	3.10E-01	1.56E-02	-3.95E+00
Consumption of non-renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	1.14E+02	4.96E+01	5.68E+01	8.53E+00	2.54E+00	-1.95E+02	9.63E-01	-6.16E+01
Consumption of non-renewable primary energy resources used as raw materials	MJ	7.01E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.96E+02	0.00E+00	-3.94E+01
Total consumption of non-renewable primary energy resources	MJ	1.88E+02	4.96E+01	5.92E+01	8.53E+00	2.54E+00	9.62E-01	9.63E-01	-1.15E+02
Consumption of secondary materials	kg	2.20E+00	2.62E-02	5.53E-03	7.77E-04	8.53E-04	4.62E-03	0.00E+00	-1.84E-02
Consumption of renewable secondary fuels	MJ	1.35E-01	3.13E-04	2.94E-05	4.33E-06	9.40E-06	5.99E-05	0.00E+00	-1.81E-04
Consumption of non-renewable secondary fuels	MJ	0.00E+00	0.00E+00	4.58E-02	6.88E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net consumption of freshwater resources	m^3	2.51E-02	8.19E-03	2.49E-02	2.31E-03	3.20E-04	1.67E-03	1.39E-04	-3.95E-02

Table 14. Life cycle assessment (LCA) results for SPC Floor – (DU: 1 m^{2}4.5 mm)- environmental information describing waste categories

Indicator	Unit	A1	A2	A3	A1-A3	C2	C3	C4	D
Hazardous waste, neutralized	kg	2.17E-01	7.88E-02	1.11E-02	8.79E-05	2.85E-03	1.74E-02	1.40E-06	-1.43E-01
Non-hazardous waste, neutralised	kg	9.90E+00	1.45E+00	6.84E-02	4.57E-03	5.07E-02	2.80E-01	3.67E+00	-5.61E+00
Radioactive waste	kg	1.63E-04	5.46E-06	4.32E-05	6.38E-06	1.90E-07	6.35E-06	5.42E-06	-7.76E-05
Materials for recycling	kg	2.65E-03	2.00E-04	9.40E-01	8.79E-06	7.87E-06	1.66E+00	0.00E+00	-1.46E-03
Materials for energy recovery	kg	1.13E-05	1.54E-06	8.18E-04	7.69E-08	6.37E-08	4.71E-07	0.00E+00	-4.28E-06
Exported energy	MJ	1.66E-01	0.00E+00	1.70E-01	2.54E-02	0.00E+00	2.13E+00	0.00E+00	-5.94E-02

Table 15. Life cycle assessment (LCA) results for SPC Floor- additional indicators (DU: 1 m^2; 4.5 mm)

Indicator	Unit	A1	A2	A3	C1	C2	C3	C4	D
Particulate matter	disease incidence	INA	INA	INA	INA	INA	INA	INA	INA
Potential human exposure efficiency relative to U235	eg. kBq U235	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for ecosystems	CTUe	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for humans (cancer effects)	CTUh	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for humans (non-cancer effects)	CTUh	INA	INA	INA	INA	INA	INA	INA	INA
Potential soil quality index	dimensionless	INA	INA	INA	INA	INA	INA	INA	INA

Table 16. Life cycle assessment (LCA) results for SPC Floor– the environmental impacts (DU: 1 m²; 5.0 mm)

Indicator	Unit	A1	A2	A3	C1	C2	C3	C4	D
Global Warming Potential	eq. kg CO_2	8.89E+00	3.82E+00	4.02E+00	5.72E-01	1.92E-01	1.12E+01	4.36E-02	-6.21E+00
Greenhouse gas potential - fossil	eq. kg CO_2	9.25E+00	3.80E+00	3.91E+00	5.61E-01	1.92E-01	1.12E+01	4.31E-02	-6.18E+00
Greenhouse gas potential - biogenic	eq. kg CO_2	-3.84E-01	1.94E-02	1.10E-01	1.64E-02	6.55E-04	5.97E-03	4.35E-04	-2.08E-02
Global warming potential - land use and land use change	eq. kg CO_2	1.62E-02	2.27E-03	1.32E-03	1.97E-04	7.52E-05	1.60E-04	4.37E-05	-5.03E-03
Stratospheric ozone depletion potential	eq. kg CFC 11	1.81E-06	8.28E-07	9.34E-08	1.15E-08	4.43E-08	1.63E-06	1.31E-08	-2.25E-06
Soil and water acidification potential	eq. mol H+	4.89E-02	1.48E-02	4.17E-02	6.23E-03	7.77E-04	2.29E-01	3.64E-04	-2.47E-02
Eutrophication potential - freshwater	eq. kg P	2.86E-03	3.70E-04	7.10E-03	1.06E-03	1.29E-05	2.89E-05	1.25E-05	-1.49E-03
Eutrophication potential - seawater	eq. kg N	8.74E-03	4.07E-03	6.06E-03	9.01E-04	2.35E-04	1.23E-01	1.25E-04	-5.07E-03
Eutrophication potential - terrestrial	eq. mol N	8.95E-02	4.07E-03	5.12E-02	7.62E-03	2.56E-03	1.32E+00	1.36E-03	-5.06E-02
Potential for photochemical ozone synthesis	eq. kg NMVOC	3.63E-02	1.38E-02	1.44E-02	2.13E-03	7.84E-04	3.25E-01	3.95E-04	-1.83E-02
Potential for depletion of abiotic resources - non-fossil resources	eq. kg Sb	4.25E-04	2.40E-05	1.84E-05	2.74E-06	6.79E-07	2.05E-06	1.46E-07	-6.15E-05
Abiotic depletion potential - fossil fuels	MJ	2.10E+02	5.55E+01	6.57E+01	9.50E+00	2.84E+00	1.08E+00	9.96E-01	-1.27E+02
Water deprivation potential	eq. m^3	5.48E+00	3.44E-01	1.32E+00	1.97E-01	1.31E-02	2.10E-01	5.79E-03	-2.46E+00

* The value of the carbon footprint of the product in the product stage A1 A3 is 16.73 kg CO_2/m^2

Table 17. Life cycle assessment (LCA) results for SPC Floor – the environmental aspects (DU: 1 m²; 5.0 mm)

Indicator	Unit	A1	A2	A3	C1	C2	C3	C4	D
Consumption of renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	1.39E+01	1.20E+00	4.70E+00	7.05E-01	4.08E-02	3.47E-01	1.75E-02	-4.38E+00
Consumption of renewable primary energy resources used as raw materials	MJ	3.54E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total consumption of renewable primary energy resources	MJ	1.76E+01	1.20E+00	4.71E+00	7.05E-01	4.08E-02	3.47E-01	1.75E-02	-4.41E+00
Consumption of non-renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	1.27E+02	5.55E+01	6.36E+01	9.53E+00	2.84E+00	-2.18E+02	1.08E+00	-6.89E+01
Consumption of non-renewable primary energy resources used as raw materials	MJ	7.83E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.19E+02	0.00E+00	-4.40E+01
Total consumption of non-renewable primary energy resources	MJ	2.10E+02	5.55E+01	6.62E+01	9.53E+00	2.84E+00	1.08E+00	1.08E+00	-1.29E+02
Consumption of secondary materials	kg	2.46E+00	2.93E-02	6.18E-03	8.68E-04	9.53E-04	5.16E-03	0.00E+00	-2.06E-02
Consumption of renewable secondary fuels	MJ	1.51E-01	3.50E-04	3.28E-05	4.84E-06	1.05E-05	6.69E-05	0.00E+00	-2.02E-04
Consumption of non-renewable secondary fuels	MJ	0.00E+00	0.00E+00	5.12E-02	7.69E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net consumption of freshwater resources	m^3	2.80E-02	9.15E-03	2.78E-02	2.58E-03	3.58E-04	1.86E-03	1.55E-04	-4.41E-02

Table 18. Life cycle assessment (LCA) results fo SPC Floor– the environmental impacts relate to waste management (DU: 1 m²; 5.0 mm)

Indicator	Unit	A1	A2	A3	C1	C2	C3	C4	D
Hazardous waste, neutralized	kg	2.42E-01	8.81E-02	1.24E-02	9.83E-05	3.19E-03	1.95E-02	1.57E-06	-1.59E-01
Non-hazardous waste, neutralised	kg	1.11E+01	1.62E+00	7.65E-02	5.11E-03	5.66E-02	3.13E-01	4.11E+00	-6.27E+00
Radioactive waste	kg	1.83E-04	6.10E-06	4.83E-05	7.13E-06	2.12E-07	7.09E-06	6.06E-06	-8.68E-05
Materials for recycling	kg	2.96E-03	2.24E-04	1.05E+00	9.83E-06	8.80E-06	1.85E+00	0.00E+00	-1.63E-03
Materials for energy recovery	kg	1.26E-05	1.72E-06	9.15E-04	8.60E-08	7.12E-08	5.27E-07	0.00E+00	-4.78E-06
Exported energy	MJ	1.85E-01	0.00E+00	1.91E-01	2.83E-02	0.00E+00	2.38E+00	0.00E+00	-6.64E-02

Table 19. Life cycle assessment (LCA) results for SPC Floor – the environmental additional information (DU: 1 m^2; 5.0 mm)

Indicator	Unit	A1	A2	A3	C1	C2	C3	C4	D
Particulate matter	disease incidence	INA	INA	INA	INA	INA	INA	INA	INA
Potential human exposure efficiency relative to U235	eg. kBq U235	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for ecosystems	CTUe	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for humans (cancer effects)	CTUh	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for humans (non-cancer effects)	CTUh	INA	INA	INA	INA	INA	INA	INA	INA
Potential soil quality index	dimensionless	INA	INA	INA	INA	INA	INA	INA	INA

VERIFICATION

The process of verification of this EPD was in accordance with ISO 14025 and ISO 21930. After verification, this EPD is valid for a 5-year-period. EPD does not have to be recalculated after 5 years if the data have not changed significantly.

THE BASIS FOR LCA ANALYSIS WAS EN 15804 AND ITB PCR A
Independent verification corresponding to ISO 14025 (sub clause 8.1.3.)
☒ EXTERNAL ☐ INTERNAL
External verification of EPD: Ph.D. Eng. Halina Prejzner
LCA. LCI audit and input data verification: Ph.D, D.Sc.Eng. Michał Piasecki. m.piasecki@itb.pl

The declaration owner has the sole ownership, liability, and responsibility for the declaration. Declarations of construction products may not be comparable if they do not comply with EN 15804+A2. For further information about comparability, see EN 15804 and ISO 14025

Normative references

- ITB PCR A v 1.6. General Product Category Rules for Construction Products
- EN 14041 Resilient, textile and laminate floor coverings - Essential characteristicsISO 14025:2006. Environmental labels and declarations – Type III environmental declarations – Principles and procedures
- ISO 21930:2017 Sustainability in buildings and civil engineering works – Core rules for environmental product declarations of construction products and services
- ISO 14044:2006 Environmental management – Life cycle assessment – Requirements
- and guidelines
- EN 15804+A2 Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products
- CRU Group. Carbon footprint by cold metal by country - https://www.crugroup.com/about-cru/
- European Life Cycle Database. ELCD 3.2. http://eplca.jrc.ec.europa.eu/ELCD3/index.xhtml?stock=default
- Ecoinvent Database. http://www.ecoinvent.org/database/.
- KOBiZE Wskaźniki emisyjności CO_2, SO_2, NO_x, CO i pyłu całkowitego dla energii elektrycznej, 2021

Signature Not Verified
Dokument podpisany przez Michał Piasecki; ITB
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CERTIFICATE № 457/2023
of TYPE III ENVIRONMENTAL DECLARATION

Products:

DECORA SPC FLOOR

Manufacturer:

Decora S.A.

ul. Prądzyńskiego 24, 63-000 Środa Wielkopolska, Poland

confirms the correctness of the data included in the development of
Type III Environmental Declaration and accordance with the requirements of the standard

EN 15804+A2

Sustainability of construction works.
Environmental product declarations.
Core rules for the product category of construction products.

This certificate, issued on 26th May 2023 is valid for 5 years
or until amendment of mentioned Environmental Declaration

Head of the Thermal Physic, Acoustics and Environment Department
Agnieszka Winkler-Skalna, PhD

INSTYTUT TECHNIKI BUDOWLANEJ

Deputy Director for Research and Innovation
Krzysztof Kuczyński, PhD

Warsaw, May 2023