Annex

For EPD

Thermal insulation composite system with EPS insulating board glued and dowelled

of

ENVIRONMENTAL PRODUCT DECLARATION
according to *ISO 14025* and *EN 15804+A2*

Owner of declaration	Verband für Dämmsysteme, Putz und Mörtel e.V.
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General information

This document is a public annex to EPD WDVS with EPS insulating board glued and dowelled with the declaration number EPD-WDV-20240371-IBP1-DE.
The declared unit is 1m² WDVS. The life cycle balance data is based on 2022 production data.

General product information

The WDVS under consideration comprises the following components:

Function	Component	Data sources	Appendix WDVS with EPS
Mounting	Mineral bonding mortar [kg/m²]	EPD-VDP-20230401-IBO1-DE	5.0
	Organic bonding mortar [kg/m²]	VDL-20190057-IBG1-DE	
	PU foam [kg/m²]	Generic dataset from MLC database	
	Dowels [kg/m²]	EJO-20210060-IBD1-DE	0.285
Insulating material	EPS [kg/m²]	Generic dataset from MLC database	2.4
	Mineral wool [kg/m²]	Generic dataset from MLC database	
	Soft wood fibre [kg/m²]	Generic dataset from MLC database	
Coating system	Mineral base coat [kg/m²]	EPD-VDP-20230398-IBO1-DE	22.50
	Mineral rendering coat [kg/m²]	EPD-VDP-20230401-IBO1-DE	5.60
	Organic rendering coat [kg/m²]	VDL-20190057-IBG1-DE	
	Reinforcement fabric [kg/m²]	VIT-20220104-IAC1-DE	0.176
	Coupling agent [kg/m²]	VDL-20190052-IBG1-DE	0.3
	Mineral finishing coat [kg/m²]	EPD-VDP-20230398-IBO1-DE	3
	Organic finishing coat DP [kg/m²]	VDL-20190056-IBG1-DE	

1. LCA: Calculation rules and scenarios

Declared unit

Designation	Value	Unit
Declared unit	1	m²
Mass per unit area	39.3	kg/m²

Characteristic product properties biogenic carbon

Only the packaging contains biogenic carbon, not the product itself.

Information describing the biogenic carbon content at the factory gate

Designation	Value	Unit
Biogenic carbon contained in product	0	kg C
Biogenic carbon contained in packaging	0.23	kg C

Transport to construction site (A4)

Designation	Value	Unit
Litres of fuel	0.11	l/100km
Transport distance	100	km
Capacity utilisation (including empty runs)	61	%

Installation in building (A5)

Module A5 covers the power consumption for installation and packaging treatment.

Designation	Value	Unit
Power consumption	7.58	MJ
Packaging (wood pallet)	0.51	kg
Packaging (wood)	0.05	kg
Packaging PE	0.045	kg
Packaging PP	0.263	kg

Energetic credits based on thermal utilisation result from the electricity mix and thermal energy produced from natural gas (EU).

See chap. 2.12 Use for details of use (B1)

Carbonation is accounted for in module B1 as per the published figures for VDPM Mortar EPDs.

Designation	Value	Unit
Carbonation during use	-4.31	kg CO_2-eq.

End of life (C1-C4)

Module C1: mechanical deconstruction (excavator)
Module C2: 50 km transport by diesel truck, EURO 6, total load 40 tonnes, 61% degree of capacity utilisation
Module C3: waste processing of overall system (e.g., shredding, sorting) and thermal treatment of high-calorific insulating materials (EPS and wood fibre insulating material) in refuse incinerators (RI) (R1>0.6);
Module C4: disposal of all other materials; module D: credits for substitution of electric and thermal energy extracted from natural gas (EU mix) during packaging and insulating materials recycling.

Designation	Value	Unit
Waste type collected separately	39.3	kg
To waste processing C3	39.3	kg
To energy recovery C3	2.4	kg
To landfill C4	36.9	kg

Reuse, recuperation and recycling potential (D)

Energetic credits based on thermal utilisation result from the electricity mix and thermal energy produced from natural gas (EU).

2. LCA: Results

The following tables show the life cycle assessment results in relation to the life cycle stages under consideration. See chapter 1 for the basic details of all declared modules.

SPECIFICATION OF SYSTEM BOUNDARIES (X = INCLUDED IN LIFE CYCLE ASSESSMENT; MND = MODULE OR INDICATOR NOT DECLARED)

Production stage			Building construction stage		Usage stage							Disposal stage				Credits and burdens outside the system boundaries
Raw materials supply	Transport	Manufacture	Transport from manufacturer to site of use	Installation	Use / Application	Maintenance	Repair	Replacement	Renewal	Energy consumption for operation of building	Water consumption for operation of building	Deconstruction / Demolition	Transport	Waste treatment	Disposal	Reuse, recuperation or recycling potential
A1	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
X	X	X	X	X	X	MND	MND	MND	MND	MND	MND	X	X	X	X	X

LIFE CYCLE ASSESSMENT RESULTS – ENVIRONMENTAL IMPACT acc. to EN 15804+A2: 1 m² WDVS-EPS (39.3 kg)

Parameters	Unit	A1-A3	A4	A5	B1	C1	C2	C3	C4	D
GWP total	kg CO_2-eq.	2.05E+01	3.23E-01	3.29E+00	-4.31E+00	1.05E-02	2.39E-01	1.60E+01	5.56E-01	-3.73E+00
GWP-fossil	kg CO_2-eq.	2.13E+01	3.20E-01	2.41E+00	0.00E+00	1.04E-02	2.37E-01	1.60E+01	5.54E-01	-3.71E+00
GWP-biogenic	kg CO_2-eq.	-8.30E-01	1.16E-03	8.84E-01	-4.31E+00	4.64E-05	8.61E-04	2.21E-03	1.44E-05	-1.91E-02
GWP-luluc	kg CO_2-eq.	1.45E-02	1.92E-03	2.42E-04	0.00E+00	6.21E-05	1.42E-03	1.19E-03	1.72E-03	-2.23E-04
ODP	kg CFC11-eq.	9.17E-11	7.90E-14	3.26E-13	0.00E+00	2.56E-15	5.85E-14	1.15E-12	1.42E-12	-2.49E-11
AP	mol H+-eq.	3.07E-02	4.27E-04	2.01E-03	0.00E+00	1.42E-04	3.08E-04	1.06E-02	3.93E-03	-4.26E-03
EP-freshwater	kg P-eq.	6.98E-05	7.55E-07	2.15E-07	0.00E+00	2.45E-08	5.59E-07	9.67E-07	1.12E-06	-5.16E-06
EP-marine	kg N-eq.	9.26E-03	1.59E-04	6.33E-04	0.00E+00	6.47E-05	1.14E-04	3.35E-03	1.01E-03	-1.29E-03
EP-terrestrial	mol N-eq.	1.04E-01	1.89E-03	7.58E-03	0.00E+00	7.11E-04	1.35E-03	3.94E-02	1.12E-02	-1.38E-02
POCP	kg NMVOC-eq.	8.88E-02	3.78E-04	1.74E-03	0.00E+00	1.93E-04	2.73E-04	9.23E-03	3.06E-03	-3.61E-03
ADPE	kg Sb-eq.	2.97E-04	2.31E-08	8.05E-09	0.00E+00	7.48E-10	1.71E-08	3.85E-08	2.56E-08	-2.33E-07
ADPF	MJ	3.66E+02	4.36E+00	2.14E+01	0.00E+00	1.41E-01	3.22E+00	1.20E+02	7.37E+00	-6.67E+01
WDP	m^3 world-eq. deprived	1.05E+00	1.68E-03	1.96E-01	0.00E+00	5.45E-05	1.24E-03	6.86E-01	6.06E-02	-3.02E-01
Key	GWP = global warming potential; ODP = atmospheric ozone layer depletion potential; AP = soil and water acidification potential; EP = eutrophication potential; POCP = tropospheric ozone formation potential; ADPE = abiotic resource scarcity potential – non-fossil resources (ADP – substances); ADPF = abiotic resource scarcity potential – fossil fuels (ADP – fossil energy carriers); WDP = water deprivation potential (user)									

LIFE CYCLE ASSESSMENT RESULTS – RESOURCE UTILISATION INDICATORS acc. to EN 15804+A2: 1 m² WDVS-EPS (39.3 kg)

Parameters	Unit	A1-A3	A4	A5	B1	C1	C2	C3	C4	D
PERE	[MJ]	3.61E+01	2.92E-01	8.65E+00	0.00E+00	9.47E-03	2.16E-01	1.79E+00	1.21E+00	-1.70E+01
PERM	[MJ]	1.05E+01	0.00E+00	-8.45E+00	0.00E+00	0.00E+00	0.00E+00	-1.01E+00	0.00E+00	0.00E+00
PERT	[MJ]	4.66E+01	2.92E-01	2.03E-01	0.00E+00	9.47E-03	2.16E-01	7.81E-01	1.21E+00	-1.70E+01
PENRE	[MJ]	2.49E+02	4.36E+00	3.55E+01	0.00E+00	1.41E-01	3.23E+00	2.21E+02	7.38E+00	-6.67E+01
PENRM	[MJ]	1.18E+02	0.00E+00	-1.41E+01	0.00E+00	0.00E+00	0.00E+00	-1.01E+02	0.00E+00	0.00E+00
PENRT	[MJ]	3.67E+02	4.36E+00	2.14E+01	0.00E+00	1.41E-01	3.23E+00	1.20E+02	7.38E+00	-6.67E+01
SM	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	[m^3]	5.84E-02	2.60E-04	7.57E-03	0.00E+00	8.42E-06	1.92E-04	3.30E-02	1.86E-03	-1.38E-02
Key	PERE = renewable primary energy as energy carrier; PERM = renewable energy for material utilisation; PERT = total renewable primary energy; PENRE = non-renewable primary energy as energy carrier; PENRM = non-renewable primary energy for material utilisation; PENRT = total non-renewable primary energy; SM = use of secondary materials; RSF = renewable secondary fuels; NRSF = non-renewable secondary fuels; FW = net utilisation of sweet water resources									

LIFE CYCLE ASSESSMENT RESULTS – OUTPUT FLOWS AND WASTE CATEGORIES: 1 m² WDVS-EPS (39.3 kg)

Parameters	Unit	A1-A3	A4	A5	B1	C1	C2	C3	C4	D
HWD	[kg]	1.74E-06	7.36E-12	1.07E-09	0.00E+00	2.38E-13	5.44E-12	6.07E-09	1.59E-10	-4.59E-09
NHWD	[kg]	5.81E-01	6.53E-04	2.36E-02	0.00E+00	2.12E-05	4.83E-04	7.92E-02	3.69E+01	-3.11E-02
RWD	[kg]	3.87E-03	5.74E-06	1.83E-03	0.00E+00	1.86E-07	4.25E-06	1.04E-02	8.29E-05	-4.51E-03
CRU	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MER	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EEE	[MJ]	0.00E+00	0.00E+00	2.83E+00	0.00E+00	0.00E+00	0.00E+00	1.22E+01	0.00E+00	0.00E+00
EET	[MJ]	0.00E+00	0.00E+00	6.53E+00	0.00E+00	0.00E+00	0.00E+00	2.80E+01	0.00E+00	0.00E+00

Key	HWD = hazardous waste sent to landfill; NHWD = disposed non-hazardous waste; RWD = disposed radioactive waste; CRU = components for reuse; MFR = materials for recycling; MER = materials for energy recovery; EEE = exported energy – electric; EET = exported energy – thermal

LIFE CYCLE ASSESSMENT RESULTS – additional effect categories acc. to EN 15804+ A2-optional: 1 m² WDVS-EPS (39.3 kg)

Parameters	Unit	A1-A3	A4	A5	B1	C1	C2	C3	C4	D
PM	Cases of illness	5.87E-07	3.50E-09	1.85E-08	0.00E+00	7.58E-09	2.21E-09	9.92E-08	4.83E-08	-3.62E-08
IR	kBq U235-eq.	3.97E-01	6.15E-04	1.42E-01	0.00E+00	1.99E-05	4.55E-04	8.06E-01	9.42E-03	-7.50E-01
ETP-fw	CTUe	1.89E+02	3.15E+00	4.87E+00	0.00E+00	1.02E-01	2.33E+00	2.70E+01	4.02E+00	-1.29E+01
HTP-c	CTUh	5.20E-09	6.34E-11	1.07E-10	0.00E+00	2.05E-12	4.69E-11	5.66E-10	6.19E-10	-7.10E-10
HTP-nc	CTUh	3.48E-07	3.22E-09	6.87E-09	0.00E+00	1.58E-10	2.40E-09	3.64E-08	6.81E-08	-2.28E-08
SQP	SQP	2.04E+02	1.55E+00	3.49E-01	0.00E+00	5.03E-02	1.15E+00	1.47E+00	1.86E+00	-1.12E+01

Key	PM = potential occurrence of disease caused by particulate emissions; IR = potential effect through human exposition to U235; ETP-fw = potential toxicity reference unit for ecosystems; HTP-c = potential toxicity reference unit for humans (carcinogenic effect); HTP-nc = potential toxicity reference unit for humans (non-carcinogenic effect); SQP = potential soil quality index

Qualifier 1 – applies to the indicator potential effect through human exposition to U235: This effect category mainly covers the potential impact of low-dosage ionising radiation on human health in the nuclear fuel cycle. It does not account for effects caused by possible nuclear accidents and occupational exposition nor for the disposal of radioactive waste in subterranean installations. This indicator also does not cover the potential ionising radiation emitted by the ground, radon, and certain construction materials.

Qualifier 2 – applies to the indicators: abiotic resource scarcity potential – non-fossil resources, abiotic resource scarcity potential – fossil fuels, water deprivation potential (user), potential toxicity reference unit for ecosystems, potential toxicity reference unit for humans – carcinogenic effect, potential toxicity reference unit for humans – non-carcinogenic effect, and potential soil quality index: Diligence must be applied when using the results of the environmental impact indicator because they are fraught with high uncertainties or experience with the indicator is limited.

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