epddanmark

Owner: Shark Solutions ApS
No.: MD-22112-EN
Issued: 26-10-2022
Valid to: 26-10-2027

3ʳᵈ PARTY **VERIFIED**

EPD

VERIFIED ENVIRONMENTAL PRODUCT DECLARATION | **ISO 14025 & EN 15804**

SHARK®
SOLUTIONS

epddanmark

Owner of declaration
Shark Solutions ApS
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SHARK®
SOLUTIONS

Programme
EPD Danmark
www.epddanmark.dk

epddanmark

☐ Industry EPD
☒ Product EPD

Declared product(s)
SharkDispersionMW™ and SharkDispersionSX2™

Number of declared datasets/product variations: 1

Production site
Shark Solutions BVBA,
Fabriekstraat 145 A
3900 Pelt
BE-Belgium

Product use
Ingredient. An example of a typical use is as a binder in carpets or paint.

Declared/ functional unit
1 kg

Year of data
2020

EPD version
1

Issued:
26-10-2022

Valid to:
26-10-2027

Basis of calculation
This EPD is developed in accordance with the European standard EN 15804+A2.

Comparability
EPDs of construction products may not be comparable if they do not comply with the requirements in EN 15804. EPD data may not be comparable if the datasets used are not developed in accordance with EN 15804 and if the background systems are not based on the same database.

Validity
This EPD has been verified in accordance with ISO 14025 and is valid for 5 years from the date of issue.

Use
The intended use of an EPD is to communicate scientifically based environmental information for construction products, for the purpose of assessing the environmental performance of buildings.

EPD type
☐ Cradle-to-gate with modules C1-C4 and D
☐ Cradle-to-gate with options, modules C1-C4 and D
☐ Cradle-to-grave and module D
☒ Cradle-to-gate
☐ Cradle-to-gate with options

CEN standard EN 15804 serves as the core PCR

Independent verification of the declaration and data, according to EN ISO 14025

☐ internal   ☒ external

Third party verifier:

_____
Guangli Du, Aalborg University

_____
Martha Katrine Sørensen
EPD Danmark

Life cycle stages and modules (MND = module not declared)																
Product			Construction process		Use								End of life				Beyond the system boundary
Raw material supply	Transport	Manufacturing	Transport	Installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Re-use, recovery and recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

Product information

Product description

The main product components are shown in the table below.

Material	Weight-% of declared product
rPVB*	40-50
Water	50-55
Additives	<6

* Recycled polyvinyl butyral

Representativity

This declaration, including data collection and the modeled foreground system including results, represents the production of dispersion MW and SX2 from the production site located in Belgium. Product specific data are based on average values collected in the period 2020. Background data are based on GaBi database version 2022.1 and are less than 10 years old. Generally, the used background datasets are of high quality, and the majority of the datasets are only a couple of years old.

Hazardous substances

SharkDispersionMW™ and SharkDispersionSX2™ do not contain substances listed on the "Candidate List of Substances of Very High Concern for authorisation"

(http://echa.europa.eu/candidate-list-table)

Essential characteristics

The product is recycled PVB, rPVB, as waterborne dispersion to act and replace binders in several industrial applications. Essential characteristics are defined for the final products, in which the rPVB ingredient is incorporated. This intermediate rPVB ingredient is thus not covered by a specific technical specification or a defined declaration of performance.

Diverse technical information about the intermediate product can be obtained by contacting the manufacturer or on the manufacturers website:

https://shark-solutions.com/

Reference Service Life (RSL)

No RSL is declared. This EPD does not include the use stage.

Picture of product(s)

LCA background

Declared unit

The LCI and LCIA results in this EPD relates to 1 kg dispersion product.

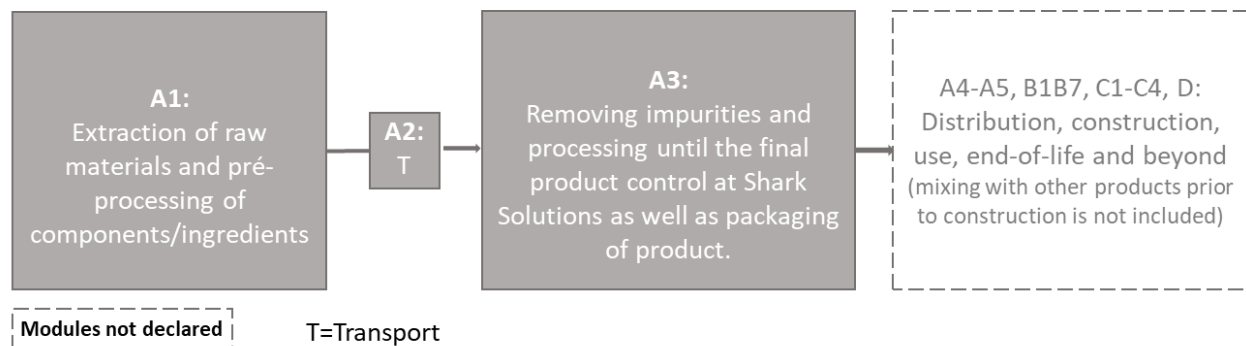| Name	Value	Unit
Declared unit	1	Kg
Density	1.03	kg/L
Conversion factor to 1 kg.	1	-

Functional unit

Not defined

PCR

This EPD is developed according to the core rules for the product category of construction products in EN 15804.

Guarantee of Origin – certificates

Flowdiagram

Foreground system:

This EPD calculates the use of elecriticy based on national grid mix even though the product is produced using electricity covered by GO in production. Remaining energy processes are also modelled using national grid mix.

Background system:

Upstream and downstream processes are modelled using the electricity sources, which the applied datasets are based on. This information is rarely specified in the background documentation of the Sphera and eco-invent datasets. However, it is typically based on national electricity grid mix.

A1:
Extraction of raw materials and pré-processing of components/ingredients

A2:
T

A3:
Removing impurities and processing until the final product control at Shark Solutions as well as packaging of product.

A4-A5, B1B7, C1-C4, D:
Distribution, construction, use, end-of-life and beyond (mixing with other products prior to construction is not included)

Modules not declared

T=Transport

This EPD is based on a cradle-to-gate LCA, in which 100 weight-% has been accounted for.

The general rules for the exclusion of inputs and outputs follows the requirements in EN 15804, 6.3.5, where the total of neglected input flows per module shall be a maximum of 5 % of energy usage and mass and 1 % of energy usage and mass for unit processes.

Product stage (A1-A3) includes:

A1 – Extraction and processing of raw materials

A2 – Transport to the production site

A3 – Manufacturing processes

The product stage comprises the acquisition of all raw materials, products and energy, transport to the production site, packaging and waste processing up to the "end-of-waste" state or final disposal. The LCA results are not declared in aggregated form for the product stage, which means, that the sub-modules A1, A2 and A3 are declared separately for the sake of transparency. No allocations of relevance were carried out.

At Shark Solution's production site the rPVB is processed and impurities are removed by applying Shark Solutions patented technology consisting of a series of processing steps designed specifically for rPVB recycling. Finally additives are added, a final quality control is performed and the final product is distributed in drums, IPC containers or full tank loads.

LCA results

ENVIRONMENTAL IMPACTS PER KG											
Parameter	Unit	A1	A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
GWP-total	[kg CO_2 eq.]	1,54E-01	6,36E-03	3,21E-01	ND	ND	ND	ND	ND	ND	ND	ND
GWP-fossil	[kg CO_2 eq.]	5,78E-02	6,32E-03	3,20E-01	ND	ND	ND	ND	ND	ND	ND	ND
GWP-biogenic	[kg CO_2 eq.]	-5,52E-03	-8,04E-06	1,12E-03	ND	ND	ND	ND	ND	ND	ND	ND
GWP-luluc	[kg CO_2 eq.]	1,02E-01	5,16E-05	6,98E-04	ND	ND	ND	ND	ND	ND	ND	ND
ODP	[kg CFC 11 eq.]	3,12E-09	8,05E-19	4,53E-15	ND	ND	ND	ND	ND	ND	ND	ND
AP	[mol H^+ eq.]	2,91E-04	2,03E-05	6,16E-04	ND	ND	ND	ND	ND	ND	ND	ND
EP-freshwater	[kg P eq.]	1,72E-05	1,87E-08	1,89E-06	ND	ND	ND	ND	ND	ND	ND	ND
EP-marine	[kg N eq.]	3,14E-04	9,37E-06	2,54E-04	ND	ND	ND	ND	ND	ND	ND	ND
EP-terrestrial	[mol N eq.]	8,30E-04	1,05E-04	2,77E-03	ND	ND	ND	ND	ND	ND	ND	ND
POCP	[kg NMVOC eq.]	2,36E-04	1,83E-05	6,01E-04	ND	ND	ND	ND	ND	ND	ND	ND
ADPm[1]	[kg Sb eq.]	3,95E-07	4,80E-10	6,13E-08	ND	ND	ND	ND	ND	ND	ND	ND
ADPf[1]	[MJ]	1,09E+00	8,39E-02	6,31E+00	ND	ND	ND	ND	ND	ND	ND	ND
WDP[1]	[m^3 world eq. deprived]	2,43E-02	5,48E-05	4,43E-02	ND	ND	ND	ND	ND	ND	ND	ND
Caption	GWP-total = Globale Warming Potential - total; GWP-fossil = Global Warming Potential - fossil fuels; GWP-biogenic = Global Warming Potential - biogenic; GWP-luluc = Global Warming Potential - land use and land use change; ODP = Ozone Depletion; AP = Acidification; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water use											
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: $1,95*10^2$ or 195, while 1,12E-11 is the same as $1,12*10^{-11}$ or 0,0000000000112.											
Disclaimer	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.											

ADDITIONAL ENVIRONMENTAL IMPACTS PER KG											
Parameter	Unit	A1	A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
PM	[Disease incidence]	8,53E-09	1,10E-10	3,91E-09	ND	ND	ND	ND	ND	ND	ND	ND
IRP[2]	[kBq U235 eq.]	1,12E-02	1,46E-05	5,76E-02	ND	ND	ND	ND	ND	ND	ND	ND
ETP-fw[1]	[CTUe]	2,64E+00	6,06E-02	3,04E+00	ND	ND	ND	ND	ND	ND	ND	ND
HTP-c[1]	[CTUh]	7,11E-11	1,22E-12	7,15E-11	ND	ND	ND	ND	ND	ND	ND	ND
HTP-nc[1]	[CTUh]	1,06E-09	7,20E-11	3,58E-09	ND	ND	ND	ND	ND	ND	ND	ND
SQP[1]	-	5,68E+00	2,88E-02	1,37E+00	ND	ND	ND	ND	ND	ND	ND	ND
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless)											
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: $1,95*10^2$ or 195, while 1,12E-11 is the same as $1,12*10^{-11}$ or 0,0000000000112.											
Disclaimers	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.											
	[2] 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.											

RESOURCE USE PER KG

Parameter	Unit	A1	A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
PERE	[MJ]	1,09E+00	4,68E-03	1,07E+00	ND	ND	ND	ND	ND	ND	ND	ND
PERM	[MJ]	1,71E-01	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND
PERT	[MJ]	1,26E+00	4,68E-03	1,07E+00	ND	ND	ND	ND	ND	ND	ND	ND
PENRE	[MJ]	1,09E+00	8,40E-02	6,31E+00	ND	ND	ND	ND	ND	ND	ND	ND
PENRM	[MJ]	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND
PENRT	[MJ]	1,24E+00	8,40E-02	6,31E+00	ND	ND	ND	ND	ND	ND	ND	ND
SM	[kg]	5,32E-01	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND
RSF	[MJ]	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND
NRSF	[MJ]	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND
FW	[m³]	5,68E-04	5,36E-06	1,92E-03	ND	ND	ND	ND	ND	ND	ND	ND
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 = Net use of fresh water										
		The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: $1,95*10^2$ or 195, while 1,12E-11 is the same as $1,12*10^{-11}$ or 0,0000000000112.										

WASTE CATEGORIES AND OUTPUT FLOWS PER KG

Parameter	Unit	A1	A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
HWD	[kg]	1,66E-05	4,23E-12	1,25E-09	ND	ND	ND	ND	ND	ND	ND	ND
NHWD	[kg]	2,20E-04	1,25E-05	1,08E-01	ND	ND	ND	ND	ND	ND	ND	ND
RWD	[kg]	1,06E-05	1,02E-07	6,46E-04	ND	ND	ND	ND	ND	ND	ND	ND

Parameter	Unit	A1	A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
CRU	[kg]	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND
MFR	[kg]	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND
MER	[kg]	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND
EEE	[MJ]	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND
EET	[MJ]	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND
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 = Eksporteret elektrisk energi; EET = Eksporteret termisk energi										
		The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: $1,95*10^2$ or 195, while 1,12E-11 is the same as $1,12*10^{-11}$ or 0,0000000000112.										

BIOGENIC CARBON CONTENT PER KG

Parameter	Unit	At the factory gate
Biogenic carbon content in product	[kg C]	0
Biogenic carbon content in accompanying packagaing	[kg C]	0
Note		1 kg biogenic carbon is equivalent to 44/12 kg of CO_2

Additional information

LCA interpretation

The production and packaging in module A3 are the most important activities in the product stage. In practice, different packaging solutions are used for the products and the LCA calculations were therefore based on the packaging solution with the highest environmental impact, which was from the use of drums. Transportation of raw materials in module A2 is less important. The primary raw material, rPVB, does not contribute significantly because it is a secondary material.

Technical information on scenarios

There are no scenarios for modules beyond the product stage because this EPD is cradle-to-gate.

Indoor air

The EPD does not give information on release of dangerous substances to indoor air because the horizontal standards on measurement of release of regulated dangerous substances from construction products using harmonised test methods according to the provisions of the respective technical committees for European product standards are not available.

Soil and water

The EPD does not give information on release of dangerous substances to soil and water because the horizontal standards on measurement of release of regulated dangerous substances from construction products using harmonised test methods according to the provisions of the respective technical committees for European product standards are not available.

References

Publisher	www.epddanmark.dk
Programme operator	Danish Technological Institute Buildings & Environment Gregersensvej DK-2630 Taastrup www.teknologisk.dk
LCA-practitioner	 FORCE Technology Applied Environmental Assessment Park Allé 345 DK-2605 Brøndby https://forcetechnology.com/da
LCA software /background data	GaBi ts incl. database version 2022.1 + Ecoinvent 3.8
3rd party verifier	*Guangli Du* *Aalborg University, Denmark*

General programme instructions
General Programme Instructions, version 2.0, spring 2020
www.epddanmark.dk

EN 15804
DS/EN 15804 + A2:2019 - "Sustainability of construction works – Environmental
product declarations – Core rules for the product category of construction products"

EN 15942
DS/EN 15942:2011 – " Sustainability of construction works – Environmental product declarations –
Communication format business-to-business"

ISO 14025
DS/EN ISO 14025:2010 – " Environmental labels and declarations – Type III environmental declarations
– Principles and procedures"

ISO 14040

DS/EN ISO 14040:2008 – " Environmental management – Life cycle assessment – Principles and framework"

ISO 14044

DS/EN ISO 14044:2008 – " Environmental management – Life cycle assessment – Requirements and guidelines"