Environmental Product Declaration

In accordance with ISO 21930: 2017, ISO 14025:2006 and EN 15804:2012+A2:2019/AC2021 for:

Heterogeneous Wall Covering - ProtectWall from TARKETT

EPD OF MULTIPLE PRODUCTS BASED ON WORST CASE RESULTS.

Programme:	The International EPD® System. www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	S-P-0015522
Publication date:	2024-07-09
Revision date	2024-08-29 (version 1)
Valid until:	2029-07-09
	An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com

General information

Programme information

Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
E-mail:	info@environdec.com
Accountabilities for PCR, LCA and independent, third-party verification	
Product Category Rules (PCR)	
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)	
Product Category Rules (PCR): PCR 2019:14 version 1.3.3 and Sub-PCR-F Resilient textile and laminate floor coverings (EN 16810)	
PCR review was conducted by: The Technical Committee of the International EPD System. See www.environdec.com for a list of members. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat www.environdec.com/contact	
Life Cycle Assessment (LCA)	
LCA accountability: Juliette Pouansi & Perla Boumendil from TARKETT	
Third-party verification	
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☒ EPD verification by individual verifier Third-party verifier: Olivia Djiriguian *from LCIE Bureau Veritas* Approved by: The International EPD® System	
Procedure for follow-up of data during EPD validity involves third party verifier: ☒ Yes ☐ No	

The EPD owner has the sole ownership. liability. and responsibility for the EPD.

EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

This EPD is a specific EPD.

Differences versus previous version

2024-08-29 Version 1

Editorial change : Technical information on recycled content.

Company information

Owner of the EPD: Tarkett
Contact: Myriam TRYJEFACZKA. myriam.Tryjefaczka@tarkett.com. Tarkett La Défense. 1 Terrasse Bellini 92400 Paris
Description of the organisation:

With an international coverage and a wide range of products. Tarkett has over 130 years of experience in providing integrated solutions for floorings to professionals and end users.
Many of the most important architectural firms in the world and building professionals have chosen Tarkett for the value of its products and for its consultation and service abilities. Therefore. Tarkett floorings and sport surfaces are present in several prestigious architectural reference points. Tarkett offers integrated solutions for floorings. able to meet the particular needs of customers. Our wide range of designs. colors and models provides an infinite series of possibilities. contributing to create a positive environment and a better quality of life for people.
Tarkett operates with the utmost respect for the environment towards the realization of eco-friendly products.
Tarkett's commitment to the environment is woven throughout its business. Cradle-to-Cradle principles are. in fact. the basis of the design and production of every solution. Particularly. the lifecycle analysis is used to continuously improve the production process. and so the products until their use stage. disposal and recycling. The commitment to the environment is also proven by the accession to the Circular Economy 100 program. where Tarkett group. with a network of companies. is working to develop a circular economy model based on the reuse of materials and preservation of natural resources. The development of products that can be reused within internal production cycles. or external ones in case of other individuals. has been an integral part of the business strategy aimed at sustainability for many years. The WCM (World Class Manufacturing) management system has been developed in 2009. and it includes the environmental pillar aimed to the elimination of losses and to the growth of process efficiency.

Product-related or management system-related certifications: ISO 9001. ISO 14001. ISO 50001. WCM manufacturing site.
Name and location of production site(s): Clervaux (Luxembourg)

See the GPI and the PCR for other required company information.

Product information

Product name: ProtectWall 1.5 ; ProtectWall CR ; Aquarelle Wall HFS
Product identification: Aquarelle Wall HFS is a vinyl wall covering. ProtectWall 1.5, ProtectWall CR (Clean Rooms) are high-performance vinyl wall coverings. The reference product for this EPD is ProtectWall 1.5, based on the worse-case results.
Product description: Aquarelle Wall HFS is a vinyl wall covering for use in wet areas such as collective showers, locker rooms, collective housing and healthcare facilities. ProtectWall 1.5, ProtectWall CR (Clean Rooms) protect walls against impacts, scratches and stains.
UN CPC code: APE/NAF - 2223Z
Geographical scope: Modules A1-A5 as well as the use (module B) and end-of-life (module C) have been modelled to represent European technology and process coverage.

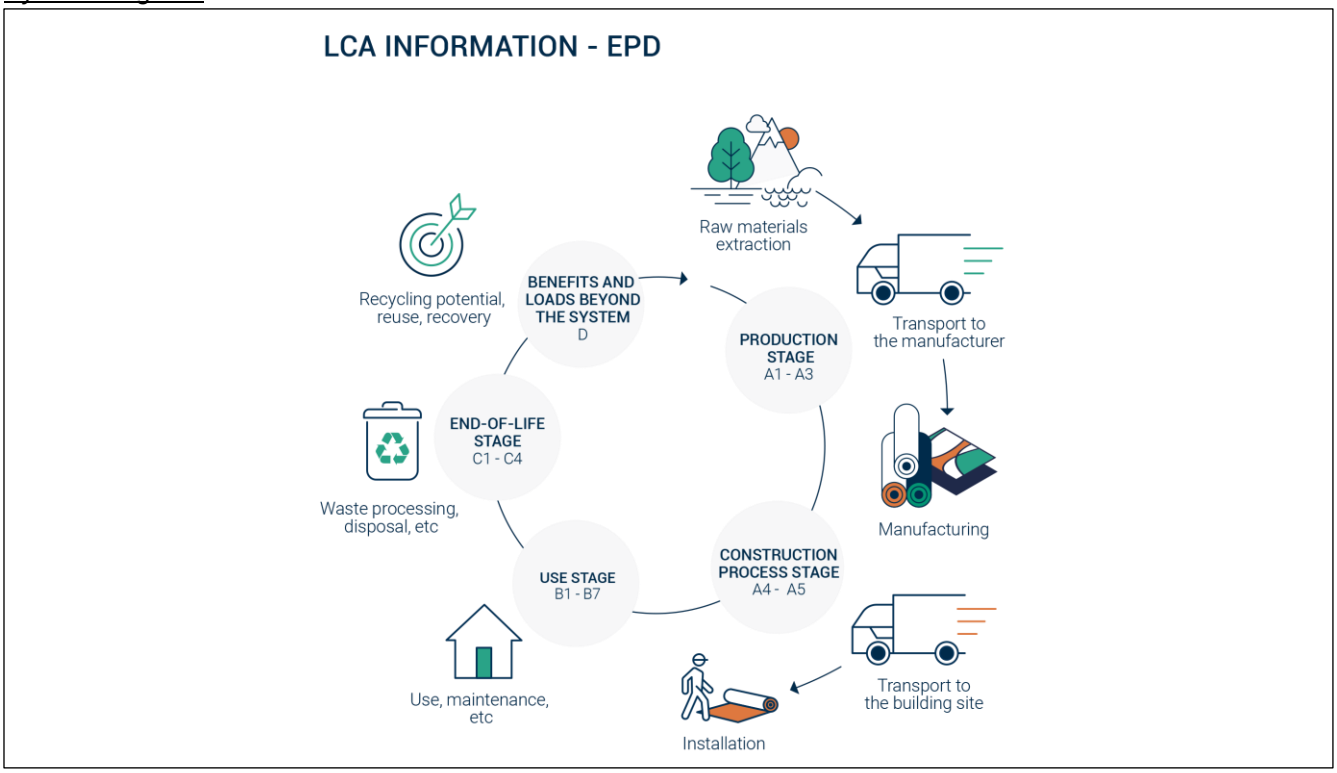
LCA information

Functional unit / declared unit: 1m² of wall covering with a reference service life (RSL) of 1 year for specified characteristics application and use areas according to ISO 10581 and EN ISO 10874. The reference flow is the number of product(s) needed to fulfil the functional unit : 1 vinyl roll covers at least 40m² of floor.
Reference service life: 1 year
Time representativeness: 2023
Database(s) and LCA software used: Ecoinvent3.9. Simapro 9.5
Description of system boundaries: Cradle to grave and module D (A + B + C + D)
Cut-off criteria : The cut-off criteria used for this study follow the guidelines set out in the PCR which conform to the EN 15804-A2, as following:
- All inputs and outputs to a (unit) process are included in the calculation where the data is available.
- A maximum of 1% of the total mass per unit process may be omitted.
- A maximum of 1% of the total renewable and non-renewable energy for a unit process may be omitted.
- A maximum of 5% of the total energy usage and mass per module may be omitted.
All input and output flows have been considered, including raw materials as per the product composition provided by the manufacturer and packaging of raw materials as well as the final product. Energy and water consumptions have also been considered at 100% according to the data provided.

Mass balance approaches (MBAs), to claim, for example, biobased, renewable, and/or recycled product content, are not applied.

EN 15804 reference package" based on EF 3.1 has been used.

System diagram:



More information: Wall coverings are classified in accordance with EN 15102 to be installed in the following areas of application:

Product	Norm	Tarkett Value
ProtectWall 1.5	EN 259-1	Heavy Duty Wall Covering
ProtectWall CR	EN 259-1	Heavy Duty Wall Covering
Aquarelle Wall HFS	EN 233	Vinyl wallcovering in roll form

Modules declared. geographical scope. share of specific data (in GWP-GHG indicator) and data variation:

	Product stage		Construction process stage			Use stage							End of life stage				Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	**A1**	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Modules declared	X	X	X	X	X		X						X	X	X	X	X
Geography	EU	EU	EU	EU	EU		EU						EU	EU	EU	EU	EU
Specific data used	-	50%	100%	100%	100%	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	22%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	0%			European average for Tarkett		-	-	-	-	-	-	-	-	-	-	-	-

Content information

In the absence of PCR for wall coverings and according to PCR 2019:14 v1.3.3. , several sets of results, reflecting different products, are not allowed to be declared in the same EPD. However, similar products from a single or several manufacturing sites covered by the same PCR and manufactured by the same company with the same major steps in the core processes may be grouped and thereby included in the same EPD;

The results of a worst case product (ProtectWall 1.5) will be declared in this EPD.

The variation in GWP-GHG results for modules A1-A3 between included products and the declared is 22%.

The components for ProtectWall 1.5 are detailed here:

ProtectWall 1.5				
Product	**Weight. kg/m²**	**Recycled content (%)**	**Difference between product and declared results GWP-GHG (%)**	**Representative Product**
ProtectWall 1.5	2.40E+00	0-4.5%	0.00E+00	ProtectWall 1.5
ProtectWall CR	2.40E+00		0.00E+00	
Aquarelle Wall HFS	1.50E+00		-2.20E+01	

The components for ProtectWall 1.5 are detailed here:

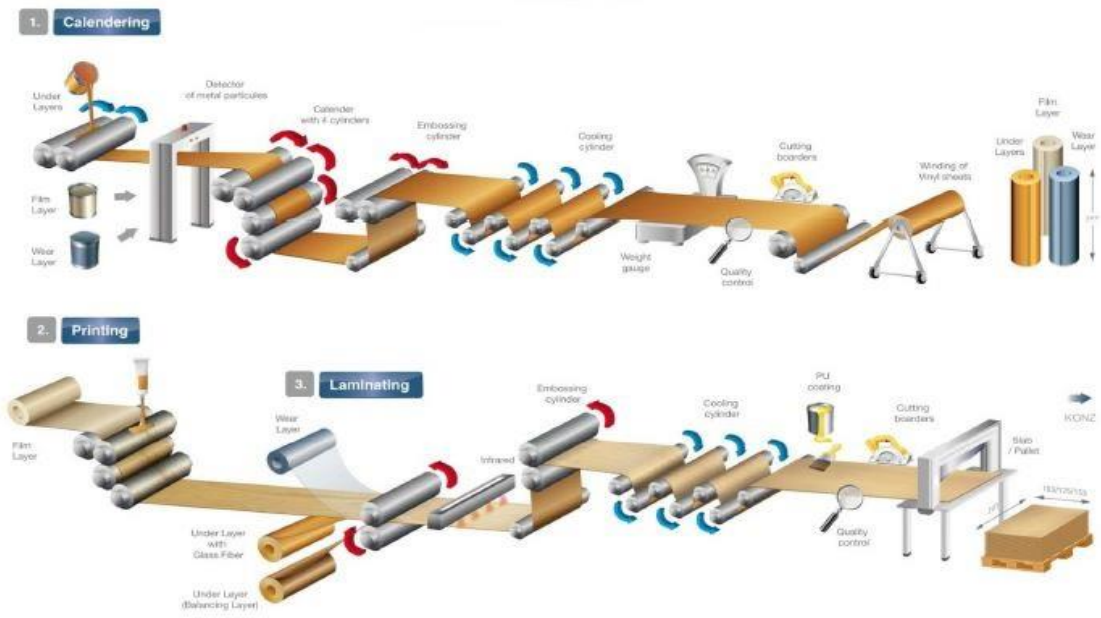
ProtectWall 1.5			
Product components	**Weight. kg/m²**	**Post-consumer material. weight-%**	**Biogenic material, weight-% and kg C/kg**
PVC Suspension	4.31E-01	0%	0%
Plasticizer	1.45E-01	0%	0%
Epoxidised soya bean oil	2.70E-02	0%	83%
Stabilizer CaZn	1.70E-02	0%	0%
Pigments	1.50E-02	0%	0%
Surface Treatment	3.00E-02	0%	0%
Flame Retardent	6.87E+00	0%	0%
Calendered Underlay	1.01E+00	0%	0%
TOTAL	2.40E+00	0%	0%
Packaging materials	**Weight. kg/m²**	**Weight-% (versus the product)**	**Weight biogenic carbon, kg C/kg**
Product Packaging Cardboard	4.43E-02	1.8%	-1.13
Product Packaging Paper (Foil)	1.16E-01	4.8%	-1.13
Product Packaging PP (Disc)	1.01E-02	0.4%	0
TOTAL	1.70E-01	7.1%	-1.24

The calendered underlay contains post-industrial recycled content, therefore, the recycled content is 7% in average.

Product manufacturing

Production process

The production of the wall covering is presented in the following figure :



Production waste

Waste type	Amount	Unit
Internal recycling - Post manufacturing - Own production	8.7E-01	kg/m²
Non-hazardous waste to external incineration	4.10E-03	kg/m²
Non-hazardous waste to external recycling	2.00E-01	kg/m²
Hazardous waste to external recycling	2.40E-03	kg/m²
Hazardous waste to incineration with energy recovery	8.40E-03	kg/m²
Non-hazardous waste to landfill	4.55E-04	kg/m²
Hazardous waste-water to external treatment	8.57E-02	kg/m²

NB: Post manufacturing recycling concerns the recycling of the losses inside the plant production. Therefore. there is no end-of-life impact on losses (except the recycling preparation).

Electricity mix

The electricity mix purchased at the manufacturing facility has the following carbon footprint:

Indicator	Amount	Unit
GWP-GHG	1.08E-01	kgCO2eq/Kwh

Health. safety and environmental aspects during production

ProtectWall production site complies with the ISO 14001 Environmental Management System and the ISO 9001 Quality Management System.

Delivery and installation

Delivery

The average distribution distance between the factory and the installation site is 1662 km. It has been calculated considering the average distance between European countries where Tarkett is selling the ProtectWall products and the factory plant in Clervaux (France). The distribution is made by truck.

Installation

The product is glued on the subwall. then the different parts of the wallcovering are welded together.

Description	Amount	Unit
Electricity consumption	4.00E-02	kWh/m²
Acrylic adhesive consumption	2.50E-01	kg/m²

Waste

During the installation approximately 10% of the wall covering is lost as off-cuts. Thanks to the ReStart program. Tarkett offers to all of its customer flooring installers a free take-back system for installation off-cuts. including equipment. logistics and recycling. This analysis therefore considers a recycling scenario of the offcuts**.**

Packaging

50 % of the packaging materials goes to incineration and 50 % goes to landfill.

Use Stage

Reference Service Life (RSL)

For this product. the stated RSL is 1 year. It should be noted, however, that the service life of a wall covering system may vary depending on the amount and nature of traffic and the type and frequency of maintenance. The manufacturer has provided this service life on the basis of his experience of wall covering manufacture and supply. This RSL is applicable as long as the product use complies with that defined by EN14041/EN 14904 and ISO10874 in accordance with the product's classification. **The service lifetime recommended by Tarkett is 20 years**.

Cleaning and maintenance

The maintenance step concerns the cleaning of the floor. Tarkett has provided the recommended maintenance routine for the product throughout the reference life. Water, detergent and electricity consumption of the cleaning machine are considered in the LCA study. The maintenance scenario is :

- **2 sponge cleanings per year.**
- **one detachment per year**

Description	Amount	Unit
Water consumption	4.10E-01	L/year/m^2
Detergent consumption	7.00E-03	L/year/m^2

Prevention of structural damage

To avoid excessive wear. usage should be restricted to the stated areas of application as outlined by the norm EN 15102.

End of Life

The End-of-Life scenario that have been modeled for the wall coverings is landfilling in module C. Tarkett also modeled an alternative scenario, incineration. The results can be found in the additionnal information.

Landfilling /L

Landfilling waste is still a proheminent waste management scenario. This option is however not recommanded by Tarkett. Environmental impacts of landfilling are presented in module **C/L**.

Incineration with energy recovery /I

Incineration with energy recovery is a rising waste management method in many of the countries in wich wall coverings are sold. While Tarkett wishes to recycle 100% of productsincineration with energy recovery is an alternative option if recycling is impossible. Environmental impacts of incineration with energy recovery are presented in module **C/I** in the additionnal information.

Benefits and loads beyond system boundary

Landfilling /L

Benefits accounted in this scenario exclusively come from installation offcuts recycling and are presented in **D/L**

Incineration with energy recovery /I

Benefits from installation offcuts recycling and incineration energy recovery are calculated in **D/I** in the additionnal information.

Results

The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

Disclaimer : ***The results of modules A1-A3 should not be used without considering the results of module C.***

Environmental Information

Potential environmental impact in case of landfilling at End-of-use

Results per functional or declared unit in case of landfilling – ProtectWall 1.5																
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1/L**	**C2/L**	**C3/L**	**C4/L**	**D/L**
GWP-total	kg CO_2 eq.	4,44E+00	7,45E-01	1,20E+00	0,00E+00	8,07E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,49E-02	0,00E+00	2,54E-01	-6,56E-01
GWP-fossil	kg CO_2 eq.	4,50E+00	7,44E-01	1,16E+00	0,00E+00	7,45E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,49E-02	0,00E+00	1,96E-01	-6,58E-01
GWP- biogenic	kg CO_2 eq.	-1,03E-01	2,38E-04	3,94E-02	0,00E+00	4,88E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,74E-06	0,00E+00	5,80E-02	5,86E-03
GWP- Luluc	kg CO_2 eq.	3,71E-02	3,66E-04	4,18E-03	0,00E+00	5,67E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,30E-06	0,00E+00	6,11E-06	-3,09E-03
AP	mol H^+ eq.	8,78E-07	1,62E-08	1,02E-07	0,00E+00	2,88E-10	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,24E-10	0,00E+00	7,78E-10	-9,45E-08
ODP	kgCFC11 eq	2,18E-02	2,40E-03	8,86E-03	0,00E+00	5,08E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,86E-05	0,00E+00	1,77E-04	-3,03E-03
EP-freshwater	kg P eq	2,12E-03	5,23E-05	3,97E-04	0,00E+00	2,63E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,04E-06	0,00E+00	1,82E-06	-2,23E-04
EP-freshwater	kg PO4 eq	6,52E-03	1,61E-04	1,22E-03	0,00E+00	8,08E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,20E-06	0,00E+00	5,59E-06	-6,85E-04
EP-marine	kg N eq.	5,56E-03	8,19E-04	1,20E-03	0,00E+00	2,43E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,67E-05	0,00E+00	1,47E-03	-6,57E-04
EP-terrestrial	mol N eq.	2,90E-02	8,64E-03	8,58E-03	0,00E+00	1,25E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,77E-04	0,00E+00	7,86E-04	-4,02E-03
POCP	kg NMVOC eq.	1,57E-02	3,58E-03	4,07E-03	0,00E+00	3,21E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,26E-05	0,00E+00	3,42E-04	-2,08E-03
ADP-minerals&metals*	kg Sb eq.	5,55E-05	2,46E-06	1,02E-05	0,00E+00	7,96E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,91E-08	0,00E+00	5,51E-08	-5,48E-06
ADP-fossil*	MJ	1,00E+02	1,06E+01	1,95E+01	0,00E+00	1,51E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,11E-01	0,00E+00	6,14E-01	-1,27E+01
WDP	m^3	3,81E+00	4,38E-02	8,33E-01	0,00E+00	3,63E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,74E-04	0,00E+00	2,77E-03	-3,79E-01
Acronyms	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 = Depletion potential of the stratospheric ozone layer; AP = Acidification potential. Accumulated Exceedance; EP-freshwater = Eutrophication potential. fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential. fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential. Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential. deprivation-weighted water consumption															

Environmental Information

Potential environmental impact in case of landfilling at End-of-use

Results per functional or declared unit in case of landfilling – ProtectWall																
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1/L**	**C2/L**	**C3/L**	**C4/L**	**D/L**
PERE	MJ	1,47E+01	1,64E-01	2,15E+00	0,00E+00	4,62E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,28E-03	0,00E+00	2,66E-02	-1,29E+00
PERM	MJ	8,41E-01	0,00E+00	8,41E-02	0,00E+00	1,05E-02	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	-1,94E-02
PERT	MJ	1,55E+01	1,64E-01	2,23E+00	0,00E+00	5,67E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,28E-03	0,00E+00	2,66E-02	-1,31E+00
PENRE	MJ	1,01E+02	1,06E+01	1,95E+01	0,00E+00	1,51E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,11E-01	0,00E+00	6,14E-01	-1,27E+01
PENRM	MJ.	5,78E+00	0,00E+00	8,46E+00	0,00E+00	5,90E-02	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	-7,53E-02
PENRT	MJ	1,07E+02	1,06E+01	2,80E+01	0,00E+00	2,10E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,11E-01	0,00E+00	6,14E-01	-1,28E+01
SM	kg	5,03E-02	0,00E+00	5,03E-03	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	0,00E+00	0,00E+00	2,34E-01
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	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m^3	7,19E-02	1,50E-03	1,70E-02	0,00E+00	-2,03E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,00E-05	0,00E+00	7,50E-04	-7,97E-03
Acronyms	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 re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water															

Waste production and output flows in case of landfilling at End-of-use

Waste production

Results per functional or declared unit in case of landfilling – ProtectWall															
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1/L**	**C2/L**	**C3/L**	**C4/L**	**D/L**
Hazardous waste disposed	kg	5,26E-01	1,01E-02	1,18E-01	0,00E+00	3,72E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,01E-04	0,00E+00	7,08E-04	-5,34E-02
Non-hazardous waste disposed	kg	2,33E+00	6,02E-01	1,28E+00	0,00E+00	4,06E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,20E-02	0,00E+00	2,65E+00	-2,50E-01
Radioactive waste disposed	kg	2,10E-04	3,44E-06	3,76E-05	0,00E+00	1,65E-07	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,87E-08	0,00E+00	3,50E-07	-2,67E-05

Output flows

Results per functional or declared unit in case of landfilling – ProtectWall																
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1/L**	**C2/L**	**C3/L**	**C4/L**	**D/L**
Components for re-use	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Material for recycling	kg	1,07E+00	0,00E+00	2,59E-01	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	0,00E+00	0,00E+00	0,00E+00
Materials for energy recovery	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy. electricity	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy. thermal	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Additional indicator

Results per functional or declared unit in case of landfilling – ProtectWall																
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1/L**	**C2/L**	**C3/L**	**C4/L**	**D/L**
GWP-GHG[1]	kg CO_2 eq.	4,54E+00	7,44E-01	1,16E+00	0,00E+00	8,02E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,49E-02	0,00E+00	1,96E-01	-6,61E-01

[1] GWP-GHG is the sum of GWP-Fossil and GWP-LULUC indicators

Variability of LCA results

The declared environmental impacts are the impacts of the worst case product. The data was collected for the two sites of production. The variability of the results was calculated by doing a sensitivity analysis as recommended by the EN15804+A2/CN.

Variation of environmental impacts for all indicators greater than 10% for A1-C modules

Impact category	**Unit**	**min**	**max**
Climate change - total	kg CO2 eq	-36%	-22%
Climate change - fossil	kg CO2 eq	-36%	-22%
Climate change - land use and change	kg CO2 eq	-29%	-21%
Ozone depletion	kg CFC11 eq	-40%	-33%
Acidification	mol H+ eq	-49%	-18%
Eutrophication, freshwater	kg P eq	-41%	-17%
Eutrophication, marine	kg N eq	-62%	-27%
Eutrophication, terrestrial	mol N eq	-24%	-16%
Photochemical ozone formation	kg NMVOC eq	-51%	-26%
Resource use, minerals and metals	kg Sb eq	-62%	-29%
Resource use, fossils	MJ	-46%	-24%
Water use	m3 depriv,	-58%	-27%
Particulate matter	disease inc,	-56%	-28%
Ionising radiation	kBq U-235 eq	-13%	-10%
Ecotoxicity, freshwater	CTUe	-70%	-30%
Human toxicity, cancer	CTUh	-30%	-16%
Human toxicity, non-cancer	CTUh	-31%	-19%
Land use	Pt	-23%	-17%
Renewable primary energy excl, RM	MJ, net CV	-63%	-19%
Total renewable primary energy	MJ, net CV	-62%	-18%
Non renewable primary energy excl, RM	MJ, net CV	-46%	-24%
Total non renewable primary energy	MJ, net CV	-43%	-21%
Use of secondary material	kg	-69%	14%
Net use of fresh water	m3	-69%	-24%
Hazardous waste disposed	kg	-47%	-30%
Non hazardous waste disposed	kg	-34%	-27%
Radioactive waste disposed	kg	-35%	-16%

Additional information – Potential impacts and flows in case of incineration

Results per functional or declared unit in case of incineration - ProtectWall						
Indicator	**Unit**	**C1/I**	**C2/I**	**C3/I**	**C4/I**	**D/I**
GWP-total	kg CO_2 eq.	0,00E+00	4,98E-02	6,06E-02	4,60E+00	-1,56E+00
GWP-fossil	kg CO_2 eq.	0,00E+00	4,97E-02	2,64E-03	4,53E+00	-1,56E+00
GWP- biogenic	kg CO_2 eq.	0,00E+00	1,58E-05	5,80E-02	7,11E-02	4,32E-03
GWP- Luluc	kg CO_2 eq.	0,00E+00	2,43E-05	8,02E-07	5,28E-04	-3,75E-03
AP	mol H^+ eq.	0,00E+00	1,62E-04	2,55E-05	3,87E-03	-6,18E-03
ODP	kgCFC11 eq	0,00E+00	1,08E-09	1,11E-09	1,14E-07	-1,35E-07
EP-freshwater	kg P eq	0,00E+00	3,48E-06	2,76E-07	2,22E-04	-5,31E-04
EP-freshwater	kg PO4 eq	0,00E+00	5,57E-05	8,83E-06	1,19E-03	-1,18E-03
EP-marine	kg N eq.	0,00E+00	5,89E-04	9,69E-05	1,08E-02	-9,28E-03
EP-terrestrial	mol N eq.	0,00E+00	2,42E-04	2,81E-05	3,30E-03	-4,15E-03
POCP	kg NMVOC eq.	0,00E+00	1,64E-07	2,47E-08	1,07E-05	-6,45E-06
ADP-minerals&metals*	kg Sb eq.	0,00E+00	7,05E-01	7,52E-02	8,03E+00	-2,66E+01
ADP-fossil*	MJ	0,00E+00	2,91E-03	3,37E-03	7,16E+00	-4,50E-01
WDP	m^3	0,00E+00	4,98E-02	6,06E-02	4,60E+00	-1,56E+00
Results per functional or declared unit in case of incineration - ProtectWall						
Indicator	**Unit**	**C1/I**	**C2/I**	**C3/I**	**C4/I**	**D/I**
PERE	MJ	0,00E+00	1,09E-02	6,08E-04	7,44E-01	-2,38E+00
PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-1,94E-02
PERT	MJ	0,00E+00	1,09E-02	6,08E-04	7,44E-01	-2,39E+00
PENRE	MJ	0,00E+00	7,05E-01	7,52E-02	8,03E+00	-2,66E+01
PENRM	MJ.	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-7,53E-02
PENRT	MJ	0,00E+00	7,05E-01	7,52E-02	8,03E+00	-2,67E+01
SM	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,34E-01
RSF	MJ	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
FW	m^3	0,00E+00	1,00E-04	8,03E-05	2,18E-01	-1,29E-02
Results per functional or declared unit in case of incineration - ProtectWall						
Indicator	**Unit**	**C1/I**	**C2/I**	**C3/I**	**C4/I**	**D/I**
Hazardous waste disposed	kg	0,00E+00	6,71E-04	4,44E-05	1,38E+00	-6,33E-02
Non-hazardous waste disposed	kg	0,00E+00	4,00E-02	5,11E-01	3,69E-01	-3,83E-01
Radioactive waste disposed	kg	0,00E+00	2,29E-07	4,94E-07	1,53E-05	-6,59E-05
Results per functional or declared unit in case of incineration - ProtectWall						
Indicator	**Unit**	**C1/I**	**C2/I**	**C3/I**	**C4/I**	**D/I**
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Material for recycling	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy recovery	kg	0,00E+00	0,00E+00	0,00E+00	1,21E+00	0,00E+00
Exported energy. electricity	MJ	0,00E+00	0,00E+00	0,00E+00	9,34E+00	0,00E+00
Exported energy. thermal	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Information on biogenic carbon content

Results per functional or declared unit		
BIOGENIC CARBON CONTENT	**Unit**	**QUANTITY**
Biogenic carbon content in product	kg C	0.0644
Biogenic carbon content in packaging	kg C	0.05

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO_2.

References

General Programme Instructions of the International EPD® System. Version 4.0. 2021-03-29.
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