EPD®
THE INTERNATIONAL EPD® SYSTEM

ECO PLATFORM EPD VERIFIED

pipelife.com

MASTER|3PLUS

SOIL AND WASTE FITTINGS

ENVIRONMENTAL PRODUCT DECLARATION

In accordance with **ISO 14025:2006** and **EN 15804:2012+A2:2019/AC:2021 for:**
PIPELIFE Master3Plus soil and waste pipe fittings*

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD owner:	Wienerberger AG | wienerberger
EPD registration number:	EPD-IES-0015178
Publication date:	2024-07-04
Valid until:	2029-06-04

*EPD of multiple products, based on the average result of the product group.

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

PIPELIFE
always part of your life

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): Construction Products PCR 2019:14 v1.3.4

PCR review was conducted by: The Technical Committee of the International EPD® System. A full list of members available on www.environdec.com.

Chair of the PCR review: Claudia A. Peña. The review panel may be contacted at info@environdec.com.

LIFE CYCLE ASSESSMENT (LCA)

LCA accountability: Ieke Bak and Jurie Potgieter, Ecochain Technologies

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: Anni Oviir, LCA support

Approved by: The International EPD® System

Procedure for follow-up of data during EPD validity involves third party verifier:

☐ Yes ☒ No

[The procedure for following up on the validity of the EPD is required at least once a year to confirm whether the information in the EPD remains valid or if the EPD needs to be updated during its validity period. The follow-up can be organized entirely by the EPD owner or together with the original verifier via an agreement between the two parties. In both approaches, the EPD owner is responsible for ensuring the procedure is carried out. If a change that requires an update is identified, the EPD shall be re-verified by a verifier.]

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

EPDs within the same product category (construction) but registered in different EPD programmes, or not compliant with EN 15804, and seen in a building context, 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.

COMPANY INFORMATION

Owner of the EPD:
WIENERBERGER AG, Wienerbergerplatz 1, 1100 Vienna, Austria

Contact:

Oliver Bannert, oliver.bannert@wienerberger.com

Description of the organisation:

PIPELIFE deploys industry 4.0 technologies to measure and reduce our energy and raw material consumption, as well as the related CO2 emissions.

Product-related or management system-related certifications:

Quality management systems and environmental measures are implemented at all PIPELIFE production sites, meeting national as well as international standards such as ISO 9001 (Quality Management System) and ISO 14001 standards (Environmental Management System).

Name and location of production site(s):

PIPELIFE Polska SA, Torfowa 4, 84-110 Krokowa, Kartoszyno, Poland

PRODUCT INFORMATION

PRODUCT NAME: PIPELIFE Master3Plus soil and waste fitting

PRODUCT DESCRIPTION:

PIPELIFE Master3Plus fittings suppress noise from soil and waste activity. Our hydraulically optimized fittings are highly compatible, easy to integrate and deliver tangible benefits for designers, installers, investors and residents. The Master3Plus acoustic soil and waste system effectively reduces airborne and structure-borne sound below 10 decibels.

MULTIPLE PRODUCTS COVERAGE:

The declared unit of this EPD is 1 kg PIPELIFE Master3Plus soil and waste pipe fitting. The results per kg are based on the weighted average of all products in the PIPELIFE Master3Plus soil and waste fitting product line. The table below provides the mass per piece. These masses should be used to calculate the LCA result per 1 piece, by multiplying the environmental results of all modules with the weight specified below.

PIPELIFE MASTER3PLUS SOIL AND WASTE FITTING PRODUCTS WITH CONVERSION FACTOR COVERED IN THIS EPD

PRODUCT	MASS (KG/PC)
3496100971	0.010
3496100972	0.041
3496100973	0.056
3496100974	0.061
3496100976	0.032
3496100977	0.032
3496100978	0.032
3496100979	0.031
3496101195	0.033
3496102491	0.092
3496102492	0.093
3496102493	0.097
3496102494	0.098
3496102495	0.102
3496102496	0.103
3496102497	0.445
3496102498	0.439
3496102499	0.467
3496102500	0.095
3496102501	0.350
3496102502	0.521
3496102503	0.521
3496102504	0.187
3496102506	0.348
3496102508	0.155
3496102509	0.159
3496102510	0.172
3496102511	0.499
3496102512	0.501
3496102513	0.544
3496102514	0.448
3496102515	0.450
3496102516	0.491
3496102517	0.838
3496102518	0.838
3496102519	0.886
3496102520	0.065
3496102521	0.072
3496102522	0.065
3496102523	0.092
3496102524	0.091
3496102525	0.067
3496102526	0.104
3496102527	0.103
3496102528	0.063
3496102529	0.064
3496102530	0.068
3496102531	0.068
3496102532	0.078
3496102533	0.073
3496102534	0.075
3496102535	0.075
3496102536	0.085
3496102537	0.110
3496102538	0.100
3496102539	0.118

PRODUCT	MASS (KG/PC)
3496102588	0.053
3496102589	0.067
3496102590	0,067
3496102591	0.063
3496102592	0.111
3496102593	0.110
3496102594	0.120
3496102595	0.120
3496102596	0.152
3496102597	0.152
3496102598	0,176
3496102599	0,180
3496102601	0,232
3496102602	0,235
3496102603	0,246
3496102604	0,250
3496102605	0,389
3496102606	0,394
3496102607	0,293
3496102608	0,298
3496102609	0,668
3496102610	0,668
3496102611	0.673
3496102612	0.670
3496102613	0.073
3496102614	0.176
3496102615	0.246
3496102616	0.522
3496102617	0.900
3496102618	0.087
3496102619	0.087
3496102620	0.119
3496102621	0.119
3496102622	0.245
3496102623	0.245
3496102624	0.352
3496102625	0.357
3496102626	0.147
3496102627	0.268
3496102628	0.459
3496102629	0.458
3496102630	0.612
3496102631	0.612
3496102632	0.904
3496102633	1.543
3496102634	0,105
3496102635	0.100
3496102636	0.118
3496102637	0.118
3496102638	0.147
3496102639	0.111
3496102640	0.111
3496102641	0.120
3496102642	0.134
3496102643	0.119
3496102644	0.153

PRODUCT	MASS (KG/PC)
3496102694	0.915
3496102695	0.911
3496102696	0.978
3496102697	1.353
3496102698	1.345
3496102699	1.420
3496102700	1.149
3496102701	1.142
3496102702	1.280
3496102703	1.657
3496102704	1.638
3496102705	1.412
3496102706	1.412
3496102707	1.983
3496102708	2.420
3496102709	2.421
3496102710	2.028
3496102711	2.027
3496102712	0.033
3496102713	0.033
3496102714	0.075
3496102715	0.083
3496102716	0.131
3496102717	0.128
3496102718	0.039
3496102719	0.039
3496102720	0.076
3496102721	0.076
3496102722	0.108
3496102723	0.108
3496102724	0.073
3496102750	0.170
3496102754	0.349
3496102755	0.253
3496102756	1.978
3496102757	0.336
3496102758	0.072
3496102759	0.065
3496102760	0.066
3496102761	0.018
3496102763	0.018
3496102764	0.022
3496102765	0.046
3496102766	0.147
3496102767	0.249
3496102768	0.520
3496102769	0.894
3496102859	0.033
3496102860	0.031
3496102861	0.032
3496102862	0.032
3496102863	0.032
3496102864	0.010
3496102865	0.041
3496102866	0.056
3496102867	0.061

3496102540	0.164
3496102541	0.172
3496102542	0.180
3496102543	0.184
3496102544	0.203
3496102545	0.189
3496102546	0.204
3496102547	0.208
3496102548	0.249
3496102549	0.250
3496102550	0.259
3496102551	0.277
3496102552	0.271
3496102553	0.303
3496102554	0.293
3496102555	0.329
3496102556	0.330
3496102557	0.356
3496102558	0.360
3496102559	0.385
3496102560	0.385
3496102561	0.464
3496102562	0.510
3496102563	0.504
3496102564	0.542
3496102565	0.518
3496102566	0.560
3496102567	0.641
3496102568	0.637
3496102569	0.700
3496102570	0.742
3496102571	0.739
3496102572	0.798
3496102573	0.998
3496102574	1.068
3496102575	1.164
3496102576	1.163
3496102577	1.500
3496102578	1.498
3496102579	0.022
3496102580	0.043
3496102583	0.102
3496102584	0.102
3496102585	0.146
3496102586	0.246
3496102587	0.054

3496102645	0.143
3496102646	0.169
3496102647	0.173
3496102648	0.188
3496102649	0.164
3496102650	0.302
3496102651	0,304
3496102652	0.325
3496102653	0.253
3496102654	0.249
3496102655	0.266
3496102656	0.352
3496102657	0.372
3496102658	0.316
3496102659	0,328
3496102660	0,354
3496102661	0,355
3496102662	0.333
3496102663	0.334
3496102664	0.450
3496102665	0.453
3496102666	0.408
3496102667	0.411
3496102668	0.536
3496102669	0.531
3496102670	0.556
3496102671	0.518
3496102672	0.519
3496102674	0.498
3496102676	0.489
3496102678	0.622
3496102679	0.617
3496102680	0.551
3496102681	0.537
3496102682	0.534
3496102683	0.778
3496102684	0,778
3496102685	0.710
3496102686	0.711
3496102687	0.820
3496102688	0.820
3496102689	0.820
3496102690	0.862
3496102691	1.137
3496102692	1.133
3496102693	1.191

3496102880	0.241
3496103031	0.062
3496103032	0.064
3496103033	0.093
3496103034	0.094
3496103035	0.168
3496103036	0.176
3496103037	0.244
3496103038	0.253
3496103039	0.360
3496103103	0.998
3496103104	1.068
3496103105	0.269
3496103106	1.543
3496103107	0.992
3496103108	0.992
3496103112	0.072
3496103113	0.073
3496103114	0.101
3496103115	0.193
3496103116	0.287
3496103117	0.465
3496103118	0.515
3496103119	0.557
3496103120	0.062
3496103121	0.150
3496103122	0.900
3496103123	0.106
3496103124	0.101
3496103125	0.135
3496103126	0.120
3496103127	0.156
3496103128	0.146
3496103129	0.168
3496103130	0.484
3496103131	0.537
3496103132	0.819
3496103138	0.252
3496103139	0.282
3496103140	0.656
3496103141	0.700
3496103142	0.249
3496103143	0.664
3496103144	0.169
3496103145	0.187

UN CPC code:
36320 - Tubes, pipes and hoses, and fittings therefore, of plastics

Geographical scope:
Modules A1-A3: Poland
Modules A4-D: Europe

LCA INFORMATION

Functional/declared unit:
The declared unit used in the LCA study for the product is 1 kilogram of product.

Reference service life (RSL):
The RSL for this product is 50 years.

Time represented:
The year covered by the data used for the LCA calculation is from 2022.

Database(s) and LCA software used:
For life cycle modelling of the considered product, the EcoInvent database 3.8 was used.
The modelling was done with the LCA software Ecochain Helix version 4.3.1.

System model: Allocation, cut-off, EN15804

Description of system boundaries:
The EPD considers Cradle-to-Gate with options including modules A4, A5, C1–C4 and module D.

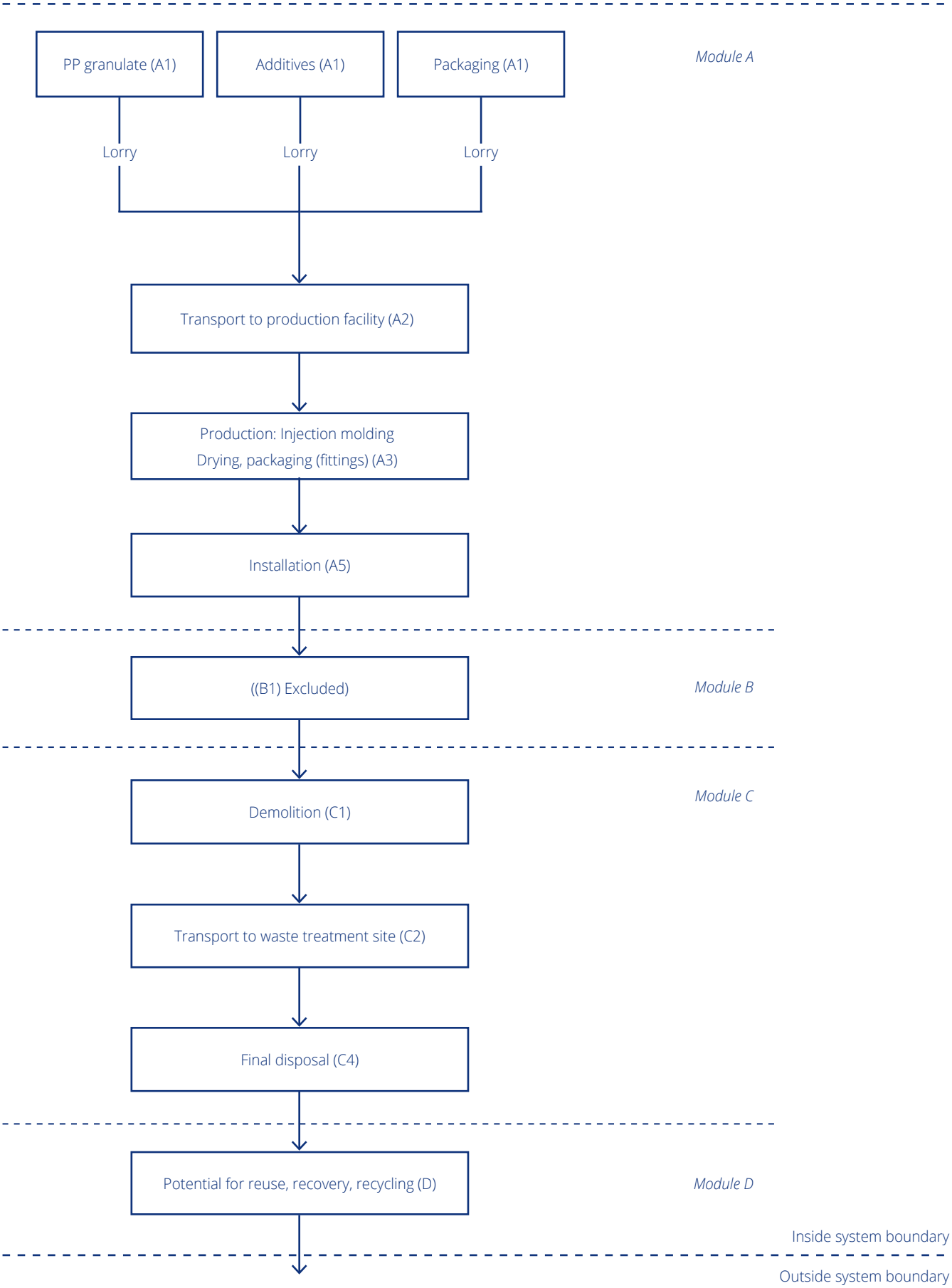
Full description:
Raw material supply (A1), transport of these materials (A2), the manufacturing of the fitting (A3), transport to construction location (A4), installation at construction location (A5), the deconstruction of the fitting (C1), the transport to the waste processor (C2), the waste processing itself (C3), the waste disposal (C4), and finally the benefits and loads beyond the system boundaries (D).

All relevant inputs and outputs, such as emissions, energy and materials, have been taken into account in this LCA. And in accordance with EN 15804+A2:2019 the total neglected input flows per module do not exceed 5% of energy usage and mass. In this LCA, the waste processes are allocated in the relevant module. In the case of the use of secondary materials or energy recovered from secondary fuels, the system boundary between the system under study and the previous system (providing the secondary materials) is set where outputs of the previous system, e.g. materials, products, building elements or energy, reach the end-of-waste state. All processes were included.

The system boundaries that have been adopted are in accordance with modular approach of EN 15804+A2. The allocation has been done based on a bulk method, in which the usages and emissions of a full production year are taken into account. The emissions are divided over internal processes, and thereafter over the full production portfolio. This is done to determine the average emissions per product.

Electricity mixes:
The electricity mix considered for the processing site in Poland is source specific wind electricity. The emission factor for the GWP-GHG indicator for the source specific wind electricity is 0.016 kg CO2eq./kWh.

SYSTEM DIAGRAM:



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

	Product stage			Con-struction 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	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	PL			EU									EU				EU
Specific data used	>90% for A1-A3			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	all impact categories [1]			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	Not relevant			-	-	-	-	-	-	-	-	-	-	-	-	-	-

Content information

Product components	Weight, kg	Post-consumer material, weight-%	Biogenic material, weight-% and kg C/ declared unit
PP	0.4583	0%	0
Filler	0.4142	0%	0
Rubber	0.1016	0%	0
Additives	0.0259	0%	0
TOTAL	1	0%	0
Packaging materials	**Weight, kg**	**Weight-% (versus the product)**	**Weight biogenic carbon, kg C/ declared unit**
Pallet	0.1612	16%	0.065
Paper/cardboard	0.2320	23%	0.022
Plastic	0.0051	1%	0
TOTAL	0.3983	40%	0.087

DANGEROUS SUBSTANCES

The product "1 kg Master3Plus soil and waste fitting" does not contain substances listed on the SVHC Candidate List for Authorization.

[1] GWP GHG:+7%/-55%; Climate change: :+7%/-55%; Acidification:+2%/-53%; Ecotoxicity, freshwater:+21%/-50; Particulate matter - disease inc.: +1%/-52%; Eutrophication, freshwater:+3%/-57%; Eutrophication, marine:-5%/-49%; Eutrophication, terrestrial:-4%/-49%; Human toxicity, cancer: +5%/-57%; Human toxicity, non-cancer:+7%/-36%; Ionising radiation:+17%/-46%; Land use:+0%/-58%; Ozone depletion:+43%/-40%; Photochemical ozone formation:+179%/-78%; Resource use, fossils:+21%/-59%; Resource use, minerals and metals:+25%/-59%; Water use:+22%-64%

ASSUMPTIONS FOR USE AND END-OF-LIFE SCENARIOS

This stage includes transportation of products to the building site. In this study, an average distance of 1500 km by truck with empty return is assumed for the transportation of products within Europe. The used dataset is market for transport, freight, lorry, unspecified | transport, freight, lorry, unspecified | Europe.

Installation into the project at the construction site (A5)

This stage includes the product installation, which is done manually and therefore no energy is needed. The waste disposal of packaging materials is considered in this scenario. The used datasets are treatment of waste paperboard, municipal incineration | waste paperboard | Switzerland;
treatment of waste wood, untreated, municipal incineration | waste wood, untreated | Switzerland;
treatment of waste paper, unsorted, sorting | waste paper, sorted | Europe without Switzerland;
wood chipping, industrial residual wood, stationary electric chipper | wood chipping, industrial residual wood, stationary electric chipper | Europe.

Deconstruction/demolition (C1)

This stage includes the demolition and removal of the product, which is done manually and therefore no energy is needed.

Transport to waste processing (C2)

This stage includes transportation of the demolished product to waste treatment facilities based on assumed transportation distances. The distances to landfill and incineration are based on the default distances according to the Bepalingsmethode. These distances are more worst-case than the distances specified for the project 'Transport of wastes to landfill, incineration and recycling facilities' of the EeBGuide. For transport to recycling facilities, the recommendation from the EeBGuide project is to use an average distance of 250km with a truck. This distance is indicated in this study, because the distance to a recycling facility is likely to be higher than distances to landfill and incineration facilities, because to date the number of recycling facilities is still low. As EN 15804 does not specify specific distances, this is considered the best approach. See the assumptions on distance and transport mode below in the table. The used dataset is market for transport, freight, lorry, unspecified | transport, freight, lorry, unspecified | Europe.

Waste processing for reuse, recovery and/or recycling (C3)

This stage includes the required waste processing for the product's region. See the assumptions on waste processing scenario's in the table below. The electrical efficiency (15.0%) and the thermal efficiency (37.1%) were considered, the total efficiency considered is 52.1%. This is not enough to consider the incineration process under C3 (the criteria for thermal recycling are not met) and therefore they are reported in C4. The used datasets are treatment of waste polyethylene, for recycling, unsorted, sorting | waste polyethylene, for recycling, sorted | Europe without Switzerland.

Disposal (C4)

This stage includes processes for components and waste that could not be recycled in module C3. See the assumptions on waste processing scenarios in the table below. The used datasets are treatment of waste polypropylene, municipal incineration | waste polypropylene | Switzerland;
treatment of waste rubber, unspecified, municipal incineration | waste rubber, unspecified | Europe without Switzerland;
treatment of waste glass, municipal incineration | waste glass | Rest-of-World;
treatment of waste paint, municipal incineration | waste paint | Europe without Switzerland;
treatment of waste polypropylene, sanitary landfill | waste polypropylene | Switzerland;

treatment of inert waste, inert material landfill | inert waste, for final disposal | Switzerland;
treatment of waste plastic, mixture, sanitary landfill | waste plastic, mixture | Switzerland;
treatment of waste paint, sanitary landfill | waste paint | Europe without Switzerland.

Reuse, recovery and/or recycling potential, expressed as net impacts and benefits (D)

See the assumptions on waste processing scenarios in the table below. The used datasets are market for pulpwood, hardwood, measured as solid wood under bark | pulpwood, hardwood, measured as solid wood under bark | Europe without Switzerland;
synthetic rubber production | synthetic rubber | Europe;
quicklime production, milled, packed | quicklime, milled, packed | Switzerland;
polyvinylchloride production, suspension polymerisation | polyvinylchloride, suspension polymerised | Europe;
polypropylene production, granulate | polypropylene, granulate | Europe;
electricity production, natural gas, combined cycle power plant | electricity, high voltage | Rest-of-World;
heat production, natural gas, at industrial furnace >100kW | heat, district or industrial, natural gas | Europe without Switzerland.

Applied End-of-Life scenarios for packaging in A5 and product in C1, C2, C3, C4, D.

Material category	Landfill	Incineration	Recycling	Reuse	Recycling/ reuse quality factor	Secondary content	Incineration LHV
Packaging, pallet	0%	10%	10%	80%	100%	0%	13.99
Packaging, paper/cardboard	0%	28%	72%	0%	100%	0%	15.92
PP, including additives	10%	20%	70%	0%	67%	0%	32.78*
Rubber (EPDM)	10%	85%	5%	0%	67%	0%	27.19
Transport distance to waste processing facility by truck with empty return (km)	50	100	250	50			

*additives have another lower heating value than PP but due to confidentiality, these are not shown here.

Processes	Packaging			Product			Unit (expressed per declared unit)
	Pallet	Paper/ cardboard	Plastics	PP, including additives	Filler	Rubber	
Collection process specified by type	0.161	0.232	0.005	0.484	0.414	0.102	Kg collected separately
		0	0	0	0	0	Kg collected with mixed construction waste
Recovery system specified by type	0.1289	0	0	0	0	0	Kg for reuse
	0.0161	0.1670	0.0003	0.339	0.290	0.005	Kg for recycling
	0.0161	0.0650	0.0044	0.097	0.083	0.086	Kg for energy recovery
Disposal specified by type	0.0000	0.0000	0.0005	0.048	0.041	0.010	Kg product or material for final deposition

RESULTS OF THE ENVIRONMENTAL PERFORMANCE INDICATORS

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

MANDATORY IMPACT CATEGORY INDICATORS ACCORDING TO EN 15804

Results per functional or declared unit																
Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-fossil	kg CO2 eq.	1.66 E+00	2.76 E-01	1.99 E-02	ND	ND	ND	ND	ND	ND	ND	0	2.49 E-02	2.36 E-01	5.26 E-01	-1.16 E-02
GWP-biogenic	kg CO2 eq.	-3.06 E-01	2.69 E-04	6.98 E-01	ND	ND	ND	ND	ND	ND	ND	0	2.44 E-05	0	2.39 E-04	-4.72 E-02
GWP-luluc	kg CO2 eq.	2.12 E-03	1.12 E-04	8.28 E-06	ND	ND	ND	ND	ND	ND	ND	0	1.02 E-05	1.46 E-04	7.19 E-06	7.61 E-04
GWP-total	kg CO2 eq.	1.35 E+00	2.76 E-01	7.17 E-01	ND	ND	ND	ND	ND	ND	ND	0	2.50 E-02	2.36 E-01	5.26 E-01	-5.80 E-02
ODP	kg CFC 11 eq.	1.55 E-07	6.46 E-08	3.71 E-09	ND	ND	ND	ND	ND	ND	ND	0	5.85 E-09	1.66 E-08	1.43 E-09	2.75 E-08
AP	mol H+ eq.	7.35 E-03	1.56 E-03	1.29 E-04	ND	ND	ND	ND	ND	ND	ND	0	1.41 E-04	6.61 E-04	8.73 E-05	1.49 E-03
EP-freshwater	kg P eq.	3.81 E-05	2.03 E-06	2.56 E-07	ND	ND	ND	ND	ND	ND	ND	0	1.83 E-07	3.53 E-06	1.08 E-07	3.98 E-05
EP-marine	kg N eq.	1.85 E-03	5.62 E-04	4.90 E-05	ND	ND	ND	ND	ND	ND	ND	0	5.08 E-05	1.85 E-04	3.72 E-05	4.21 E-04
EP-terrestrial	mol N eq.	1.78 E-02	6.18 E-03	5.33 E-04	ND	ND	ND	ND	ND	ND	ND	0	5.60 E-04	2.01 E-03	3.92 E-04	2.81 E-03
POCP	kg NMVOC eq.	3.05 E-02	1.77 E-03	1.59 E-04	ND	ND	ND	ND	ND	ND	ND	0	1.60 E-04	6.58 E-04	1.05 E-04	3.80 E-04
ADP-minerals&metals*	kg Sb eq.	1.31 E-05	9.23 E-07	1.04 E-07	ND	ND	ND	ND	ND	ND	ND	0	8.36 E-08	1.17 E-06	2.87 E-08	3.09 E-06
ADP-fossil*	MJ	4.80 E+01	4.24 E+00	2.48 E-01	ND	ND	ND	ND	ND	ND	ND	0	3.84 E-01	2.31 E+00	1.03 E-01	-6.42 E+00
WDP*	m3	9.52 E-01	1.39 E-02	2.00 E-03	ND	ND	ND	ND	ND	ND	ND	0	1.26 E-03	4.74 E-02	3.17 E-03	-1.57 E-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															

* Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

ADDITIONAL MANDATORY AND VOLUNTARY IMPACT CATEGORY INDICATORS

Results per functional or declared unit

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG	kg CO2 eq.	1.66 E+00	2.76 E-01	1.99 E-02	ND	ND	ND	ND	ND	ND	ND	0	2.49 E-02	2.36 E-01	5.26 E-01	-1.16 E-02
Particulate matter	disease inc.	8.56 E-08	3.04 E-08	2.15 E-09	ND	ND	ND	ND	ND	ND	ND	0	2.76 E-09	1.35 E-08	9.05 E-10	1.57 E-08
Ionising radiation	kBq U-235 eq	5.86 E-02	1.84 E-02	1.10 E-03	ND	ND	ND	ND	ND	ND	ND	0	1.67 E-03	6.84 E-03	3.34 E-04	6.82 E-02
Ecotoxicity, freshwater	CTUe	1.81 E+01	3.36 E+00	4.48 E-01	ND	ND	ND	ND	ND	ND	ND	0	3.04 E-01	2.30 E+00	5.58 E-01	2.45 E+01
Human toxicity, cancer	CTUh	1.15 E-09	1.34 E-10	4.08 E-11	ND	ND	ND	ND	ND	ND	ND	0	1.21 E-11	2.84 E-10	5.42 E-11	4.70 E-10
Human toxicity, non-cancer	CTUh	3.31 E-08	3.87 E-09	3.97 E-10	ND	ND	ND	ND	ND	ND	ND	0	3.50 E-10	2.51 E-09	4.86 E-10	6.38 E-09
Land Use	Pt	3.52 E+01	3.62 E+00	1.43 E-01	ND	ND	ND	ND	ND	ND	ND	0	3.28 E-01	1.80 E+00	1.20 E-01	-2.67 E+01

RESOURCE USE INDICATORS

Results per functional or declared unit

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	7.15 E+00	6.09 E-02	7.53 E-03	ND	ND	ND	ND	ND	ND	ND	0	5.52 E-03	1.14 E-01	4.03 E-03	-5.13 E+00
PERM	MJ	4.25 E+00	0.00 E+00	0.00 E+00	ND	ND	ND	ND	ND	ND	ND	0	0.00 E+00	-4.25 E+00	0.00 E+00	0.00 E+00
PERT	MJ	1.14 E+01	6.09 E-02	7.53 E-03	ND	ND	ND	ND	ND	ND	ND	0	5.52 E-03	-4.14 E+00	4.03 E-03	-5.13 E+00
PENRE	MJ	3.84 E+01	4.50 E+00	2.64 E-01	ND	ND	ND	ND	ND	ND	ND	0	4.08 E-01	2.46 E+00	1.10 E-01	-7.17 E+00
PENRM	MJ	1.31 E+01	0.00 E+00	0.00 E+00	ND	ND	ND	ND	ND	ND	ND	0	0.00 E+00	-1.18 E+01	-1.31 E+00	0.00 E+00
PENRT	MJ	5.15 E+01	4.50 E+00	2.64 E-01	ND	ND	ND	ND	ND	ND	ND	0	4.08 E-01	-9.34 E+00	-1.20 E+00	-7.17 E+00
SM	kg	0.00 E+00	0.00 E+00	0.00 E+00	ND	ND	ND	ND	ND	ND	ND	0	0.00 E+00	0.00 E+00	0.00 E+00	1.29 E-01
RSF	MJ	0.00 E+00	0.00 E+00	0.00 E+00	ND	ND	ND	ND	ND	ND	ND	0	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00
NRSF	MJ	0.00 E+00	0.00 E+00	0.00 E+00	ND	ND	ND	ND	ND	ND	ND	0	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00
FW	m^3	1.84 E-02	5.06 E-04	1.01 E-04	ND	ND	ND	ND	ND	ND	ND	0	4.58 E-05	1.31 E-03	4.20 E-04	4.01 E-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 INDICATORS

Results per functional or declared unit															
Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste disposed	kg	2.98 E-05	1.08 E-05	6.58 E-07	ND	ND	ND	ND	ND	ND	ND	0	9.79 E-07	3.80 E-06	3.98 E-07	9.20 E-06
Non-hazardous waste disposed	kg	2.94 E-01	2.83 E-01	1.16 E-02	ND	ND	ND	ND	ND	ND	ND	0	2.56 E-02	1.18 E-01	1.09 E-01	3.27 E-01
Radioactive waste disposed	kg	7.15 E-05	2.86 E-05	1.59 E-06	ND	ND	ND	ND	ND	ND	ND	0	2.59 E-06	8.66 E-06	4.58 E-07	5.89 E-05

OUTPUT FLOW INDICATORS

Results per functional or declared unit																
Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0.00 E+00	0.00 E+00	1.29 E-03	ND	ND	ND	ND	ND	ND	ND	0	0	0.00 E+00	0.00 E+00	0.00 E+00
Material for recycling	kg	0.00 E+00	0.00 E+00	1.83 E-03	ND	ND	ND	ND	ND	ND	ND	0	0	6.34 E-03	0.00 E+00	0.00 E+00
Materials for energy recovery	kg	0.00 E+00	0.00 E+00	8.54 E-04	ND	ND	ND	ND	ND	ND	ND	0	0	0.00 E+00	2.66 E-03	0.00 E+00
Exported energy, electricity	MJ	0.00 E+00	0.00 E+00	2.17 E-01	ND	ND	ND	ND	ND	ND	ND	0	0	0.00 E+00	8.11 E-01	0.00 E+00
Exported energy, thermal	MJ	0.00 E+00	0.00 E+00	5.36 E-01	ND	ND	ND	ND	ND	ND	ND	0	0	0.00 E+00	2.01 E+00	0.00 E+00

Disclaimer: It is discouraged to use the results from modules A1-A3 without also considering results from module C.

ADDITIONAL ENVIRONMENTAL INFORMATION

ENERGY EFFICIENCY

We are making huge strides in the energy efficiency of our production processes by reusing industrial off-heat, installing photovoltaic systems and utilizing closed cooling circuits. We are also using renewable energy sources to heat office buildings and increasing the number of electric vehicles in our warehouses and distribution centers.

BIODIVERSITY

As part of the world of Wienerberger, PIPELIFE is working toward self-imposed Environmental, Social and Corporate Governance Goals. Accordingly, biodiversity measures are implemented at all our production sites to encourage flora and fauna to flourish in the area.

REDUCED WASTE

As well as reusing scrap wherever suitable in our production processes, our prefab designs ensure your on-site waste is kept to the absolute minimum and can be seamlessly installed without the need for extra fittings, labor or energy. The Master3Plus assortment is 100% recyclable. Our cradle-to-cradle designs ensure that pipes and fittings can be reproduced into new quality-assured products, keeping waste to a minimum.

MEASURING AND IMPROVING EFFICIENCY

We deploy industry 4.0 technologies to measure and reduce our energy and raw material consumption, as well as their related CO2 emissions. Quality management systems and environmental measures are implemented at all PIPELIFE production sites, meeting national as well as international standards such as ISO 9001 (Quality Management System) and ISO 14001 standards (Environmental Management System).

REFERENCES

General Programme Instructions of the International EPD® System. Version 4.0. PCR 2019:14. Construction products. Version 1.3.4.

ISO 14040: Environmental management — Life cycle assessment — Principles and Framework, International Organization for Standardization, ISO 14040:2006.

ISO 14044: Environmental management — Life cycle assessment — Requirements and guidelines, International Organization for Standardization, ISO 14044:2006.

ISO 14025: Environmental labels and declarations — Type III environmental declarations — Principles and procedures, International Organization for Standardization, ISO 14025:2006.

European Committee for Standardization, EN 15804+A2:2019/AC:2021 Sustainability of construction works – Environmental product declarations — Core rules for the product category of construction products

Ecochain 4.3.1, 2024, web: http://app.Ecochain.com.

Date issued: June 2024

PIPELIFE International GmbH, Wienerbergerplatz 1, 1100 Vienna
T +43 1 602 2030 0, **E** info@pipelife.com, **pipelife.com**

PIPELIFE
always part of your life