Environmental Product Declaration

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

POLO-KAL XS

EPD of multiple products, based on the average results of the product group
(Diameter: DN32, DN40, DN50, DN75, DN90, DN110, DN125, DN160)

from

Poloplast GmbH & Co KG

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
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Valid until:	2029-01-30

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
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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): *Product Category Rules (PCR): PCR 2019:14 Construction products (EN 15804:A2) (version 1.3.1)*
PCR review was conducted by: *The Technical Committee of the International EPD® System. A full list of members* *available on www.environdec.com. The review panel may be contacted via info@environdec.com.*
Life Cycle Assessment (LCA)
Name and contact information of LCA practitioner: Dr. Carmen Arndt, brands & values GmbH. info@brandsandvalues.com
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: *Jan Weinzettel, weinzettel@seznam.cz* 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.

Company information

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Description of the organisation:
POLOPLAST primarily develops, produces and sells reinforced, multi-layer pipe systems made of plastic. Our innovative pipe systems have been proving their worth in various applications in building technology and civil engineering for over 65 years.

Product-related or management system-related certifications:
ISO 9001:2015, ISO 14001:2015

Name and location of production site(s):
Leonding, Austria

Product information

Product name:
POLO-KAL XS pipe system

Product description:
The POLO-KAL XS is designed as a highly sound-insulating multi-layer push-in socket pipe system for optimized transmission room values in the area of house drainage and covers a wide range of application areas.
Thanks to the innovative Monotec and funTec sleeve technology, pipe connections can be created without lubricants or chamfering. The integrated seal reduces the sleeve diameter and thus enables space-saving installation.
The ranges are divided into the following dimensions according to the outside diameter of the pipe (mm): DN32, DN40, DN50, DN75, DN90, DN110, DN125 and DN160. The wall thickness in mm/dimension: DN32-40, 1.8mm; DN 50, 2.0mm; DN75 2.6mm; DN90 3.0mm; DN110 3.4mm; DN125 3.9mm; DN160 4.9mm.

Product application:
Purpose:

- above ground drainage inside Buildings and buried discharge within building structure
- Controlled living space ventilation with geothermal heat exchanger
- Central vacuum system

Technical specification:
The POLO-KAL XS pipe system:

- 20 dB(A) according to EN14366 based on DIN 4109
- funTEC coating - lubricant-free
- Measurement marks attached to the pipe
- Very slim sleeve - insulating hose, stand construction and low floor structure, integrated seal that cannot be lost.

Product standards:
The materials used to this pipe System are Polypropylene, mineral fillers, thermoplastic elastomers and synthetic elastomers and is produced based on EN 1451-1

Additional technical information:
Further information can be found at: https://www.poloplast.com/en-at/products/downloads.html

LCA information

Functional unit / declared unit: 1 (one) kg average POLO-KAL XS pipe system. Packaging (0.088 kg) is included in the results. The average was weighed by production volume based on tonnage in 2022.

The results can be converted to the base of 1 m pipe with the following values:

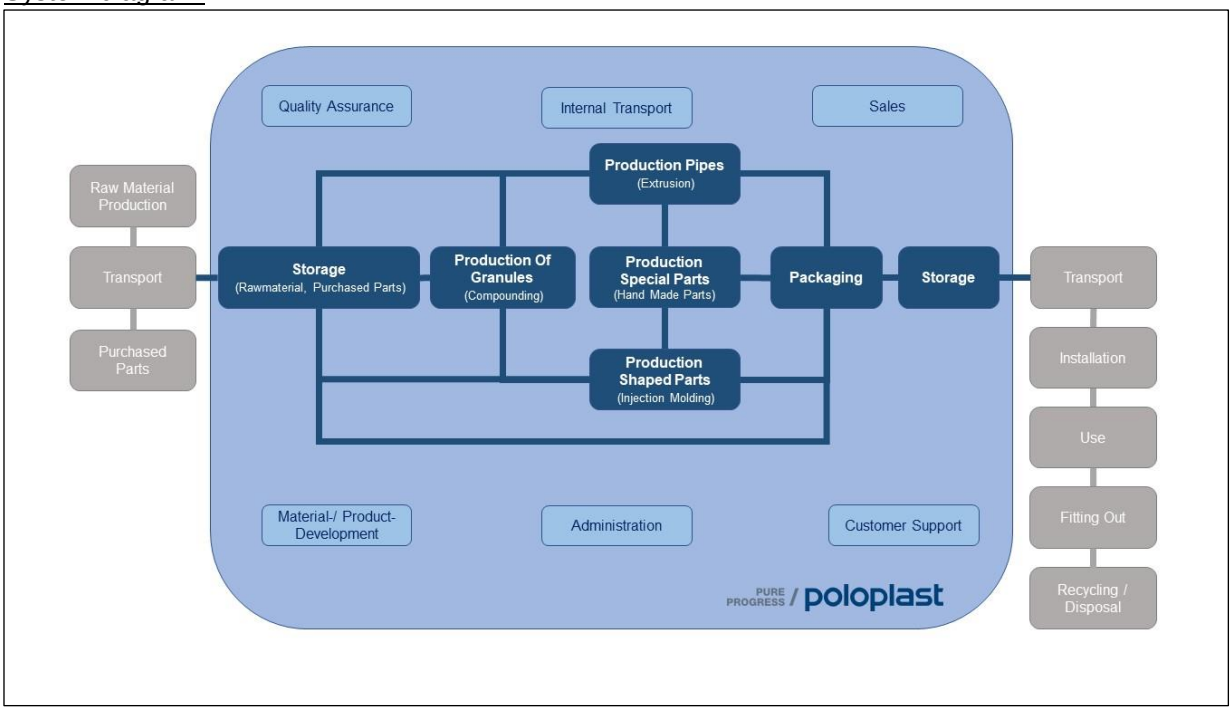
Pipe diameter	kg / 1 m pipe
DN32	0.21
DN40	0.27
DN50	0.36
DN75	0.77
DN90	1.11
DN110	1.56
DN125	1.88
DN160	3.30

Time representativeness: Production data was collected for the year 2022

Database(s) and LCA software used: LCA for Experts (Version 10.8) and Sphera LCA content (Content Version 2023.2)

Description of system boundaries:
Cradle to gate with modules C1–C4 and module D and with optional modules (A1–A3 + C + D and additional module A5);

System diagram:



The POLO-KAL XS pipe is extruded in 3 layers. The outer layer and the inner layer are colored with masterbatch on the extruder, and the middle layer material is compounded in an upstream process. The socket with integrated seal is applied to the pipe in an injection molding process. The socket material is compounded in an upstream process.

LCA-scenario:
Austrian green electricity mix was used for the manufacturing phase. In module A5, the waste treatment of the packaging materials is modelled. Wood and PET-strip are incinerated.
For waste treatment in module C3, 68% of the pipes were incinerated and 32% recycled, based on a german study (Conversio 2021). A downcycling factor of 0.69 was assumed based on price ratio of new and recycled PP-granulate. Loads and benefits after recycling and incineration in modules A5 and C3 are assigned to module D. For transports to waste treatment, a distance of 75 km is assumed.

Cut-off criteria:
The cut-off rules for taking into account the use of primary energy and mass according to EN 15804 (<1% in each case, <5% in total) were observed. Equipment and infrastructure required in production are not part of this LCA.
Material flows with a mass fraction of less than one percent were, for the most part, accounted for. Only the stabilizer with a weight percentage of 0.3 – 0.5% was cut-off. Some data sets could not be found for all substances used. In this case, the closest best option in the Sphera LCA content database, including modelling of processes were used.

Allocations:
Energy was allocated between the different types of pipes based on the mass of pipes produced.

Assumptions:
The pigments were modelled with a share of 60% polypropylene. See LCA-scenario for assumptions at EoL.

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

	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	ND	x	ND	ND	ND	ND	ND	ND	ND	x	x	x	x	x
Geography	AT/DE/ES/IT/US/FL/H/SI/JP	EU/GLO	AT		EU								EU	EU	EU	EU	EU
Specific data used	> 90%					-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	< 10% for GWP-GHG-indicator					-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	-					-	-	-	-	-	-	-	-	-	-	-	-

Content information

Product components	Weight, kg	Post-consumer material, weight-%	Biogenic material, weight-% and kg C/kg
Polypropylene	0.683	0	0
Talcum	0.289	0	0
TPE	0.010	0	0
Other (such as additives, pigments)	0.018	0	0
TOTAL	**1**	**0**	**0**
Packaging materials	**Weight, kg**	**Weight-% (versus the product)**	**Weight biogenic carbon, kg C/kg**
PET-strip	0.0011	0.11%	0
Wood	0.0873	8.7%	0.039
TOTAL	**0.0884**	**8.8%**	**0.039**

The product does not contain any REACH SVHC substances in amounts greater than 0.1 % (1000 ppm).

Results of the environmental performance indicators

Mandatory impact category indicators according to EN 15804

Indicator	Unit	A1-A3	A5	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq.	1.15E+00	1.50E-01	0.00E+00	7.28E-03	1.54E+00	0.00E+00	-7.93E-01
GWP-fossil	kg CO_2 eq.	1.30E+00	5.38E-03	0.00E+00	7.22E-03	1.54E+00	0.00E+00	-7.93E-01
GWP-biogenic	kg CO_2 eq.	-1.44E-01	1.44E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
GWP-luluc	kg CO_2 eq.	9.31E-04	4.81E-06	0.00E+00	6.66E-05	1.78E-05	0.00E+00	-1.11E-04
ODP	kg CFC 11 eq.	6.42E-11	1.43E-14	0.00E+00	9.36E-16	2.31E-13	0.00E+00	-1.72E-11
AP	mol H^+ eq.	2.52E-03	2.51E-05	0.00E+00	2.85E-05	2.12E-04	0.00E+00	-1.05E-03
EP-freshwater	kg P eq.	4.28E-06	5.69E-09	0.00E+00	2.63E-08	8.93E-08	0.00E+00	-5.96E-07
EP-marine	kg N eq.	8.04E-04	7.49E-06	0.00E+00	1.32E-05	5.47E-05	0.00E+00	-3.14E-04
EP-terrestrial	mol N eq.	8.53E-03	1.06E-04	0.00E+00	1.48E-04	9.56E-04	0.00E+00	-3.36E-03
POCP	kg NMVOC eq.	2.63E-03	2.00E-05	0.00E+00	2.58E-05	1.56E-04	0.00E+00	-9.64E-04
ADP-minerals&metals*	kg Sb eq.	1.33E-07	1.64E-10	0.00E+00	4.77E-10	1.84E-09	0.00E+00	-5.49E-08
ADP-fossil*	MJ	4.70E+01	4.23E-02	0.00E+00	9.80E-02	6.78E-01	0.00E+00	-1.89E+01
WDP*	m^3	9.84E-02	1.58E-02	0.00E+00	8.69E-05	1.64E-01	0.00E+00	-6.45E-02
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							

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

** 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

Indicator	Unit	A1-A3	A5	C1	C2	C3	C4	D
GWP-GHG[1]	kg CO_2 eq.	1.30E+00	5.39E-03	0.00E+00	7.28E-03	1.54E+00	0.00E+00	-7.93E-01

Resource use indicators

Indicator	Unit	A1-A3	A5	C1	C2	C3	C4	D
PERE	MJ	9.64E+00	1.58E+00	0.00E+00	7.13E-03	1.10E-01	0.00E+00	-3.55E+00
PERM	MJ	1.57E+00	-1.57E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	1.12E+01	9.44E-03	0.00E+00	7.13E-03	1.10E-01	0.00E+00	-3.55E+00
PENRE	MJ	5.01E-01	-2.94E-04	0.00E+00	0.00E+00	5.01E-01	0.00E+00	-1.89E+01
PENRM	MJ	2.99E+01	-2.45E-02	0.00E+00	0.00E+00	2.99E+01	0.00E+00	0.00E+00
PENRT	MJ	3.04E+01	-2.48E-02	0.00E+00	0.00E+00	3.04E+01	0.00E+00	-1.89E+01
SM	kg	8.02E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.20E-01
RSF	MJ	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
FW	m^3	9.55E-03	3.73E-04	0.00E+00	7.81E-06	3.88E-03	0.00E+00	-3.31E-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							

[1] This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO_2 is set to zero.

Waste indicators

Indicator	Unit	A1-A3	A5	C1	C2	C3	C4	D
Hazardous waste disposed	kg	5.82E-08	8.33E-13	0.00E+00	3.04E-13	3.70E-11	0.00E+00	-1.35E-08
Non-hazardous waste disposed	kg	2.29E-02	2.80E-03	0.00E+00	1.50E-05	9.41E-02	0.00E+00	3.15E-02
Radioactive waste disposed	kg	6.32E-04	2.05E-06	0.00E+00	1.84E-07	5.56E-05	0.00E+00	-9.14E-04

Output flow indicators

Indicator	Unit	A1-A3	A5	C1	C2	C3	C4	D
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
Material for recycling	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.20E-01	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
Exported energy, electricity	MJ	2.45E-02	2.01E-01	0.00E+00	0.00E+00	3.22E+00	0.00E+00	0.00E+00
Exported energy, thermal	MJ	1.02E-01	3.63E-01	0.00E+00	0.00E+00	5.73E+00	0.00E+00	0.00E+00

Additional environmental information

The electricity supplier confirmed that all of the installations has been powered by electricity from the product mix dominated by hydropower.
The hydropower dominated product mix represents the composition of the electricity output to the end customers:
80.01% hydropower
11.70% wind energy
4.26% biomass solid
1.05% biogas
2.97% Photovoltaics
0.01% other green energy
Environmental impact of electricity production:
CO2 emissions in g/kWh 0.0
Radioactive waste in mg/kWh 0.0
The guarantees of origin come 100% from Austria. All values are rounded.

References

Conversio 2021. Stoffstrombild Kunststoffrohre in Deutschland 2021

EN 15804:2012+A2:2019 + AC:2021: Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products

General Programme Instructions of the International EPD® System. Version 4.0.

ISO 14025:2006-07: Environmental labels and declarations - Type III environmental declarations - Principles and procedures

PCR 2019:14 Product category rules (PCR): Construction Products PCR 2019:14 version 1.3.1.

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