Environmental Product Declaration

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

Rotomoulded PE-HD tanks for the separation of fats, light liquids, and sediments

Average product from the ACO P-X and P-XS series manufactured by rotational molding from PE-HD: ACO Sludge Trap P-X, ACO Stormsed Vortex P-X, ACO Lipumax P-X, ACO Oleopator P-X, ACO Oleopator Bypass P-X, ACO Closing Shafts P-XS, ACO Merging and Dividing Shafts P-X, ACO Flow Regulators P-XS

from

ACO Industries Tábor s.r.o.

Programme:	"National Environmental Labeling Program" - Czech Republic (NPEZ)
Programme operator:	Ministry of the Environment of the Czech Republic
EPD registration number:	**7250008**
Publication date:	2025-09-04
Valid until:	2030-09-03

An EPD should provide current information and may be updated if conditions change.

epd

ACO

General information

Programme information:

Programme:	"National Environmental Labeling Program" - Czech Republic (NPEZ)
Address:	Ministry of the Environment of the Czech Republic Department of Voluntary Instruments 100 10 Praha 10, Vršovická 1442/65
Website:	www.mzp.cz, www.cenia.cz
E-mail:	info@mzp.cz

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): EN 15804:2012+A2:2019/AC:2021
Life Cycle Assessment (LCA)
LCA accountability: Technický a zkušební ústav stavební Praha, s.p., pobočka Plzeň, Zahradní 15, 326 00 Plzeň
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

Owner of the EPD: ACO Industries Tábor s.r.o.

Průmyslová 1158, 391 01 Sezimovo Ústí, CZ
IČO: 26033976
www.aco-industries.cz/tabor

Contact:

Klára Kalinová, kkalinova@aco.cz, 737 263 251

Description of the organisation:

ACO Industries Tábor s.r.o. is part of the ACO Group headquartered in Rendsburg/Büdelsdorf, Germany, which has been a family-owned business since its foundation in 1946. The group employs more than 5,400 people in production and sales units worldwide.

ACO Group specialises in the development and production of drainage technologies and water treatment solutions.

ACO Industries Tábor s.r.o. serves as the Competence Center for wastewater treatment technologies, primarily stormwater runoff, but also wastewater containing FOG (fat-oil-grease) and light liquids. The purpose of these technologies is to treat water to a quality that allows its safe return to the natural environment through infiltration, retention (e.g. in fire tanks or retention ponds), discharge into watercourses, or reuse (e.g. for irrigation or toilet flushing).

Production is carried out using several technologies, including plastic rotational moulding, polyethylene welding, and fiberglass winding. The portfolio is developed and manufactured in accordance with European and international standards and is subject to testing by accredited European institutes.

More at: www.swm.aco, www.discover.aco, www.buildingdrainage.aco

Product-related or management system-related certifications:

The quality of products is ensured by an effective quality management system in accordance with EN ISO 9001 and complies with the technical regulations related to the product type.

A Declaration of Performance (DoP) is issued for all products in the ACO Top Sections range in accordance with the requirements of EU Regulation No. 305/2011 (CPR)

Name and location of production site(s):

ACO Industries Tábor s.r.o.
Průmyslová 1158, 391 01 Sezimovo Ústí, CZ

Product information

Product name: Rotomoulded PE-HD tanks for the separation of fats, light liquids and sediments

Product identification:

Average product from the ACO P-X and P-XS series manufactured by rotational molding from PE-HD: ACO Sludge Trap P-X, ACO Stormsed Vortex P-X, ACO Lipumax P-X, ACO Oleopator P-X, ACO Oleopator Bypass P-X, ACO Closing Shafts P-XS, ACO Merging and Dividing Shafts P-XS, ACO Flow Regulators P-XS

Product description:

This Environmental Product Declaration (EPD) relates to the average product from the ACO P-X and P-XS range, rotationally moulded from PE-HD, intended for:

- Grease separation (EN 1825),
- Light liquid separation (EN 858-1, Class I (≤ 5 mg/l),
- Sedimentation of suspended solids (internal technical specifications, NJDEP, DWA-A 102).

Included product variants:

■ ACO Sludge Trap P-X:	750, 1000, 1250, 1500
■ ACO Stormsed Vortex P-X:	750, 1000, 1200
■ ACO Lipumax P-X:	NS 2, NS 4, NS 5,5
■ ACO Oleopator P-X:	NS 3, NS 6, NS 8, NS 10
■ ACO Oleopator Bypass P-X:	NS 3, NS 6, NS 8, NS 10
■ ACO Closing Shafts P-XS	
■ ACO Merging and Dividing Shafts P-XS	
■ ACO Flow Regulators P-XS	

Normative references and certifications:

- EN 1825-1 –Grease separators - Part 1: Principles of design, performance and testing, marking and quality control
- EN 1825-2 - Grease separators - Part 2: Selection of nominal size, installation, operation and maintenance
- EN 858-1 Separator systems for light liquids (e.g. oil and petrol) - Part 1: Principles of product design, performance and testing, marking and quality control); - Class I (≤ 5 mg/l);
- EN 858-2 Separator systems for light liquids (e.g. oil and petrol) - Part 2: Selection of nominal size, installation, operation and maintenance, fulfilled when installed according to manufacturer's instructions
- NJDEP, tested according to DIBt, classified according to DWA-A 102 – sedimentation device Stormsed Vortex P-X
- LGA test reports (EN1825, EN 858-1)
- DIBt protocol („Rotierte Behälter für Entwässerungsprodukte“ according to DIN EN 19901-1:2011-05

All products are manufactured from 100% virgin material, which ensures high chemical resistance and structural strength in compliance with Eurocodes and the relevant European standards (EN 858, EN 1825). This approach extends the service life of the products, allows full recyclability at the end of the life cycle, and minimises environmental impacts. The use of virgin materials also prevents mechanical and chemical risks during handling and installation, protects user health, and contributes to environmental protection throughout the entire service life of the products.

The low weight of the products facilitates handling and transport even to remote or difficult-to-access locations, while their compact footprint allows installation in areas with limited space.Tested by renowned European institutes (LGA, DIBt).

Thanks to their high structural strength, complete concrete encasement is not required during installation, which reduces the consumption of construction materials, speeds up installation, and lowers overall costs. An exception is installations on areas subject to D 400 load classification, where the use of a concrete distribution ring is required in accordance with the instructions provided in the installation manual. The tank itself withstands hydrostatic water pressure, as also defined in the installation documentation.

The products are manufactured in four different tank sizes according to the nominal size of the specific product.

Installation documentation:

- https://admin.discover.aco/uploads/ACO_25_07_P_X_Installation_6767e2fd68.pdf

Overview of the benefits of the P-X and P-XS portfolio:

- Manufactured from 100% virgin PE-HD, ensuring high chemical resistance and structural stability in compliance with Eurocodes and the relevant European standards (EN 1825, EN 858-1).
- Certified according to the relevant standards (EN 1825, EN 858-1, NJDEP/DIBt/DWA-A 102).
- Tested by renowned European institutes (LGA, DIBt).
- Long service life (reference life of 50 years) confirmed by tests according to DIN EN 19901-1:2011-05.
- Fully recyclable at the end of the life cycle (if not operationally contaminated), free of hazardous substances in accordance with REACH.
- Low weight allows easy handling and transport, including delivery to remote locations.
- Compact design with a low footprint reduces space requirements during installation.
- High structural strength – under installation conditions according to the installation manual, no concrete encasement is required even for deeper installations, which speeds up assembly and reduces costs.
- Installation under D 400 load conditions without the need for full concrete encasement (only a concrete ring required).
- Possible installation in accordance with EN 858-2 and the manufacturer's installation documentation.
- Resistance to hydrostatic water pressure as specified in the installation documentation.
- Design and materials resistant to UV radiation (tested according to ISO 4892-2), temperature fluctuations, and aggressive environments.
- Easy maintenance thanks to accessible service openings and removable internal components.

Sedimentation Units:

ACO sedimentation units are designed for the efficient capture of sediments and other pollutants and can be integrated into various water management systems, including facilities with risks of fat, oil, or other light liquid discharges. This process enables not only the removal of visible impurities but also contaminants bound to these particles, such as heavy metals, organic substances, or oil residues. It is estimated that up to 75% of chemical pollution in water is bound to sediments.

Sedimentation technology can be used as a standalone solution or as a pre-treatment stage for other water treatment devices, such as grease separators or light liquid separators. In these cases, they significantly extend the service life of subsequent technologies, reduce the risk of clogging, and prolong maintenance intervals. In this way, they contribute to the efficiency of the entire system and to environmental protection.

ACO Sludge Trap P-X

ACO Sludge Trap P-X is an underground sedimentation unit designed to remove solid particles such as sediments, sand, and other suspended particles from wastewater and stormwater before they enter subsequent separation devices, such as grease separators (EN 1825) or light liquid separators (EN 858). The principle of operation is based on gravitational sedimentation – heavier particles settle at the bottom of the unit, where they accumulate in the sludge chamber, while the pretreated water flows on to the next stage of treatment.

ACO Stormsed Vortex P-X

ACO Stormsed Vortex P-X utilises the principle of gravitational and hydrodynamic (vortex) separation, ensuring the effective removal of solid particles. Thanks to its unique design and the patented SDU (Sedimentation Distribution Unit), the unit protects retained sediment and eliminates the risk of its remobilisation, even in the event of internal bypass activation. With its special design, the device can efficiently remove the majority of suspended solids and floating debris, thereby protecting downstream technologies as well as the environment.

The unit is designed in accordance with NJDEP requirements, tested by DIBt (sedimentation section), and classified according to DWA-A 102. Stormsed Vortex P-X is suitable for a wide range of flow rates depending on project specifications and national requirements. Its compact design reduces space requirements and excavation works, while variable outlet connection angles simplify installation.

More information: https://www.discover.aco/bridge/bridge-area/water-treatment/plastic/aco-stormsed-vortex-p-x

Grease Separators:

FOG (Fats, Oils, Grease) are generated during common kitchen activities such as food preparation, cooking, and dishwashing. If not removed from wastewater, they accumulate on pipe walls, where over time they form solid layers that lead to blockages, pump failures, or reduced efficiency of wastewater treatment plants. In extreme cases, so-called fatbergs may develop – massive conglomerates of fat and solid waste that completely block the sewer system. These situations require costly and time-consuming removal.

In many countries, the installation of grease separators in commercial kitchens and facilities producing greasy wastewater (e.g. slaughterhouses, food processing plants) is mandatory according to EN 1825 or local regulations.

ACO Lipumax P-X

ACO Lipumax P-X is an underground grease separator designed for the separation of fats, oils, and grease (FOG) from wastewater in commercial kitchens, food processing facilities, and other operations producing greasy wastewater. The unit protects sewer systems, pumping stations, and wastewater treatment technologies from clogging and malfunctions caused by fat accumulation.

The device is certified according to EN 1825 and meets the requirements for efficient separation and safe operation.

More information: https://aco.play3d.cz/production/canteen/grease-management/grp/lipumax-px

Light Liquid Separators:

ACO light liquid separators (oil separators) are devices designed to remove mineral oils, fuels, and other hydrocarbon liquids from water before its discharge. In this way, they prevent petroleum pollution of watercourses and protect aquatic and soil ecosystems.

Their operating principle is based on gravitational separation: heavier particles (e.g. sand) settle at the bottom in the integrated sludge trap, while lighter liquids (e.g. oil, petrol) accumulate on the surface. The water then passes through a coalescence insert, which increases the separation efficiency and ensures the required residual concentration of light liquids in the treated water.

In accordance with the requirements of EN 858-1, Class I separators with a coalescence insert must achieve a maximum concentration of light liquids in the effluent of ≤ 5 mg/l during testing. **ACO Oleopator P-X and Oleopator Bypass P-X meet this requirement, are tested by renowned European institutes (e.g. LGA), and are manufactured in compliance with EN 858-1.**

ACO Oleopator P-X

ACO Oleopator P-X is a Class I light liquid separator with an integrated sludge trap and a coalescence insert, designed to achieve maximum separation efficiency in the treatment of wastewater and stormwater contaminated with mineral oils, fuels, and other hydrocarbon liquids.

In accordance with the requirements of EN 858-1, Oleopator P-X achieves during testing a maximum residual concentration of light liquids ≤ 5 mg/l, ensuring the safe discharge of water into the sewer system or directly into surface waters.

ACO Oleopator Bypass P-X

Oleopator Bypass P-X is a Class I light liquid separator with an integrated bypass system. This system allows, during heavy rainfall, a portion of the flow to be diverted past the separation chamber, while only the designed flow requiring separation passes through it. The technical design of the bypass system ensures that the cleaning (separation) process inside the separator is not affected by increased flow during bypass activation.

The bypass technology is particularly suitable for the drainage of large, paved areas such as car parks, roads, or logistics sites, where it is necessary to protect the environment against accidental oil spills while at the same time managing stormwater efficiently.

UN CPC code:

36950 Plastic building products

Geographical scope:

The generic data used from the Ecoinvent database are used with validity for the Czech Republic (e.g. energy inputs) and in the event that data for the Czech Republic are not available, data valid for the EU or according to the location of the supplier are used. Based on the evaluation according to EN 15804+A2, Annex E, tab. E.1 the generic data used meet the quality level - medium

Product packaging:

The products are delivered in accordance with the standards specified in the product description. Most products are placed on Euro pallets for transport and secured with strapping to ensure stability and safety during transportation.

Environment and health during use:

Throughout the entire production process, no special health protection measures are required beyond the legally mandated requirements for industrial worker protection.

The P-X and P-XS product range, by its design and function, contributes to environmental protection by preventing the discharge of pollutants into sewer systems and watercourses, thereby reducing negative impacts on ecosystems and human health.

Light liquid separators can also be used as part of emergency measures to capture sudden spills of petroleum products and other pollutants, thus preventing large-scale contamination of water and soil resources. Technological components such as coalescence units and automatic shut-off floats prevent secondary leakage of captured substances even during peak flow conditions.

LCA information

Functional unit / declared unit: The declared unit is 1 kg of the average manufactured product – Rotomoulded PE-HD tanks for the separation of fats, light liquids, and sediments

Average product from the ACO P-X and P-XS series manufactured by rotational molding from PE-HD: ACO Sludge Trap P-X, ACO Stormsed Vortex P-X, ACO Lipumax P-X, ACO Oleopator P-X, ACO Oleopator Bypass P-X, ACO Closing Shafts P-XS, ACO Merging and Dividing Shafts P-XS, ACO Flow Regulators P-XS

Designation	Unit	Value
Declared unit	kg	1
Conversion factor to 1 kg	kg	1

Reference service life:

This value is based on the DIBt protocol "Rotierte Behälter für Entwässerungsprodukte" prepared in accordance with DIN EN 19901-1:2011-05, which confirms the structural stability and long-term durability of products manufactured using rotational moulding technology from PE-HD.

The protocol was issued by the LGA testing institute, an independent accredited laboratory, and confirms the compliance of the products with the relevant European standards (EN 1825, EN 858-1).

The stated reference service life applies when the installation and operating conditions specified in the manufacturer's installation documentation are observed.

Time representativeness:

For specific data, the manufacturer's data for the **year 2023** is used. For generic data, data from the Ecoinvent database version 3.11 is used. Based on the evaluation according to EN 15804+A2, Annex E, tab. E.1 the generic data used meet the quality level - very good.

Database(s) and LCA software used:

SimaPro Craft calculation software, version 10.2, Ecoinvent database version 3.11.

GWP-GHG from electricity production: 0.605 kg CO2 eq/kWh (CZ residual mix).

Description of system boundaries:

"Cradle to gate with options, modules C1–C4, module D and with optional modules".

The production phase includes the following modules:

- **A1 - extraction and processing of raw materials** and production of packaging from input raw materials
- **A2 - transport of input raw materials** from the supplier to the manufacturer, waste removal
- **A3 - production of products**, production of auxiliary materials and semi-finished products, energy consumption, including waste processing until reaching a state where it ceases to be waste or after removal of the last material residues during the production phase.
- Results A1-A3 include a **"compensation report"** of biogenic CO_2 from packaging released in module A5, as module A5 is not fully included.

The construction phase includes the following modules:

- **A4 - transport to the construction site.** Transport is carried out by truck with a capacity of 16-32 t (EURO 6). Transport of the declared product unit over a distance of 1 km is considered.

The end-of-life phase includes modules:

- **C1**, deconstruction, demolition; of a product from a building including its dismantling or demolition, including the initial sorting of materials at the construction site. The decomposition and/or dismantling of the product is part of the demolition of the entire building. In this case, the consumption of 0.016 kg of diesel per 1 DJ for the dismantling process (excavator) is assumed.
- **C2**, transport to the waste processing site; transport of the discarded product as part of waste processing, e.g. to a recycling site, and transport of waste, e.g. to a final disposal site. Transport from the dismantled building is carried out by a truck with a load capacity of 16 - 32 t (EURO 6) to an inert material landfill as a demolition of a mixed building, estimated transport distance according to calculations: 50 km to a recycling center or landfill.
- **C3**, waste treatment for reuse, recovery and/or recycling; e.g. collection of waste fractions from deconstruction, and treatment of waste from material streams intended for reuse, recycling and energy recovery. A scenario is assumed where 50% of the product is recycled and 50% of the product is intended for energy recovery (ZEVO). The costs required for crushing treatment are considered (100% of the product, energy 0.03 kWh/1 kg). For recycling (for 50% of the product) water consumption for rinsing 0.5 kg /1 kg and sodium hydrochloride 0.00059 kg (1 kg; energy consumption 0.17 kWh/1 kg.
- **C4**, Waste disposal including pre-processing and site management. 0% of dismantled product is disposed of as mixed construction rubble at an inert material landfill.

Benefits and costs beyond the product system boundary are presented in module D. Module D includes:

- **D**, potential for reuse, recovery and/or recycling, expressed in net impacts or benefits. In the module D scenario, the saving of primary raw material inputs is taken into account: 0.5 kg HDPE (RE-granulate, excluding transport and energy) in another product system.

Production:

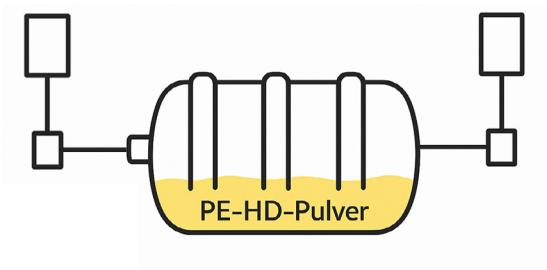
The P-X and P-XS range units are manufactured using rotational moulding technology from high-density polyethylene (PE-HD, Lupolen 4021 K RM), which provides high chemical resistance, mechanical strength, ageing resistance, and UV stability. The result is a monolithic, watertight cylindrical tank with a conical bottom and multi-level ribbing for structural stability and resistance to external pressures during underground installation.

The components are dimensioned for loads up to Class D 400 according to EN 124 and in compliance with the installation conditions defined by the manufacturer.

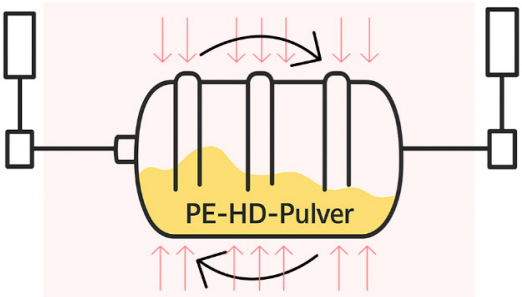
Further steps include mechanical assembly (extensions, covers according to EN 124), welding of inlet and outlet pipes, and installation of functional components depending on the device type:
- Sedimentation units: vortex separation chamber, Sediment Distribution Unit (SDU), baffle.
- Light liquid separators: inlet and outlet sections, coalescence inserts, automatic float shut-off.
- Grease separators: internal fittings for the separation of fats and oils.

The production of the products is monitored within the framework of the quality management system in accordance with ISO 9001:2015.

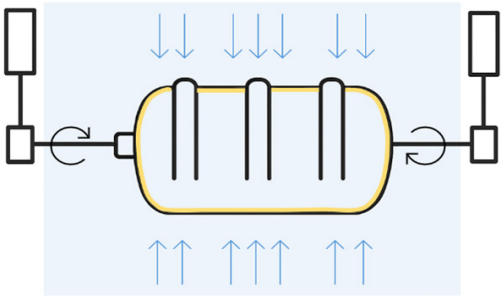
System diagram:



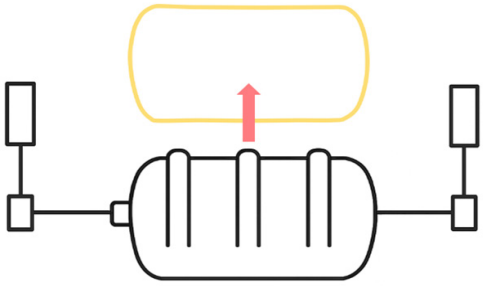
1 The powdered thermoplastic is placed into the rotational mould. The mould is then closed and inserted into the rotomoulding oven.



2 By simultaneous rotation and heating, the powder is deposited onto the inner surface of the mould.



3 The process ends when the powder is fully melted, and the required wall thickness is achieved. The mould is removed from the oven and the cooling phase follows.



4 After the cooling phase, the finished rotationally moulded part is removed from the mould.

More information:

Information module **A5** from the construction phase was not included in the LCA due to the difficult availability of input data and is therefore not declared.

Information modules from the use phase **B1 to B7** are also not declared, as these types of products, assuming correct use, do not require maintenance, repair or replacement during the normal life time in the use phase. They also do not require energy or water consumption during the use phase.

For the study, all operational data related to the consumption of main and auxiliary materials for the production of the product, energy data, diesel consumption and the distribution of annual waste production and emissions according to plant records were taken. In terms of produced waste, only those wastes that are clearly related to production activities were included in the analysis.

The processes required for the installation of production equipment and the construction of infrastructure were not included in the analysis. Also, administrative processes are not included – inputs and outputs are balanced per production phase.

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	x	ND	ND	ND	ND	ND	ND	ND	ND	x	x	x	x	x
Geography	GLO	GLO, EU	EU, CZ	EU									EU	EU	EU	EU	GLO, EU
Specific data used		> 95 %		-	-	-	-	-	-	-	-	-	-	-		-	
Variation – products		< 10 %		-	-	-	-	-	-	-	-	-	-	-		-	
Variation – sites		0 %		-	-	-	-	-	-	-	-	-	-	-		-	

The data used to calculate the EPD conforms to the following principles:

Technological point of view: Data corresponding to the current production of individual types of partial products of the plant and corresponding to the current state of the technologies used are used.

Based on the evaluation according to EN 15804+A2, Annex E, tab. E.1 the generic data used meet the quality level - very good.

The aspect of completeness and completeness: Most of the input data is based on consumption balances, which are precisely recorded in the manufacturer's information system. The reliability of the source of specific data is determined by the uniformity of the collection methodology of the information system.

Consistency point of view: Uniform points of view are used throughout the report (allocation rules, age of data, technological scope of validity, temporal scope of validity, geographical scope of validity).

Credibility aspect: All important data were checked for adherence to cross-comparison of mass balances.

The GWP-GHG variability between the sub-products included (see Product Description) is less than 10%. Pr oduction takes place at only one production site.

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.

Content information

Product components	Weight %	Post-consumer material, weight-%	Biogenic carbon content in kg C/DU
polyethylene natural	71,9	0	0
polyethylene grey	28,1	0	0
TOTAL	100	0	0

Packaging materials	Weight %	Weight-% (versus the product)	Biogenic carbon content in kg C/DU
palette	100	4,98	2,22E-02
TOTAL	100	4,98	2,22E-02

Dangerous substances from the candidate list of SVHC for Authorisation	EC No.	CAS No.	Weight-% per functional or declared unit (DU)
They are not	-	-	-

Substances listed on the list of substances of very high concern subject to authorization by the European Chemicals Agency are not contained in the product in declarable quantities.

Results of the environmental performance indicators

Mandatory impact category indicators according to EN 15804:2012+A2:2019/AC:2021 (characterisation factors based on EF 3.1 package):

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-fosil	kg CO_2 ekv.	2,53E+00	1,87E-04	ND	ND	ND	ND	ND	ND	ND	ND	1,61E-03	4,67E-03	9,67E-01	0,00E+00	-1,94E+00
GWP-biogenic	kg CO_2 ekv.	4,46E-04	1,30E-07	ND	ND	ND	ND	ND	ND	ND	ND	3,26E-07	3,24E-06	1,04E-01	0,00E+00	-4,11E-04
GWP-luluc	kg CO_2 ekv.	6,16E-04	6,28E-08	ND	ND	ND	ND	ND	ND	ND	ND	1,65E-07	1,57E-06	1,82E-04	0,00E+00	-6,26E-05
GWP-total	kg CO_2 ekv.	2,53E+00	1,87E-04	ND	ND	ND	ND	ND	ND	ND	ND	1,61E-03	4,67E-03	1,07E+00	0,00E+00	-1,94E+00
ODP	kg CFC 11 ekv.	8,63E-08	4,07E-12	ND	ND	ND	ND	ND	ND	ND	ND	2,39E-11	1,02E-10	1,56E-07	0,00E+00	-7,45E-08
AP	mol H^+ ekv.	6,41E-03	4,01E-07	ND	ND	ND	ND	ND	ND	ND	ND	1,44E-05	1,00E-05	1,29E-03	0,00E+00	-3,75E-03
EP-freshwater	kg P ekv.	2,09E-04	1,30E-08	ND	ND	ND	ND	ND	ND	ND	ND	5,19E-08	3,24E-07	1,58E-04	0,00E+00	-5,14E-05
EP-marine	kg N ekv.	1,57E-03	9,66E-08	ND	ND	ND	ND	ND	ND	ND	ND	6,70E-06	2,41E-06	2,97E-04	0,00E+00	-9,47E-04
EP-terrestrial	mol N ekv.	1,69E-02	1,04E-06	ND	ND	ND	ND	ND	ND	ND	ND	7,33E-05	2,61E-05	2,69E-03	0,00E+00	-1,03E-02
POCP	kg NMVOC ekv.	7,46E-03	6,35E-07	ND	ND	ND	ND	ND	ND	ND	ND	2,19E-05	1,59E-05	7,42E-04	0,00E+00	-4,70E-03
ADP-minerals&metals*	kg Sb ekv.	1,31E-06	6,41E-10	ND	ND	ND	ND	ND	ND	ND	ND	5,75E-10	1,60E-08	1,20E-06	0,00E+00	-2,86E-07
ADP-fosil*	MJ	8,40E+01	2,65E-03	ND	ND	ND	ND	ND	ND	ND	ND	2,10E-02	6,63E-02	2,44E+00	0,00E+00	-5,68E+01
WDP*	m^3	1,78E+00	1,04E-05	ND	ND	ND	ND	ND	ND	ND	ND	4,48E-05	2,61E-04	3,25E-02	0,00E+00	-1,05E+00

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.*
Disclaimer: If module C is included then when assessing the results of A1-A3, also take into account the results of modules C.

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[1]	kg CO_2 ekv.	2,53E+00	1,87E-04	ND	ND	ND	ND	ND	ND	ND	ND	1,61E-03	4,67E-03	9,67E-01	0,00E+00	-1,94E+00
PM	Disease incidence	8,11E-08	1,40E-11	ND	ND	ND	ND	ND	ND	ND	ND	4,11E-10	3,50E-10	8,49E-09	0,00E+00	-4,29E-08
IRP	kBq U235 ekv.	1,14E-01	3,20E-06	ND	ND	ND	ND	ND	ND	ND	ND	8,93E-06	8,01E-05	5,51E-02	0,00E+00	-4,51E-02
ETP-fw	CTUe	1,42E+01	3,56E-04	ND	ND	ND	ND	ND	ND	ND	ND	1,14E-03	8,90E-03	3,17E+01	0,00E+00	-8,38E+00
HTP-c	CTUh	8,40E-10	3,12E-14	ND	ND	ND	ND	ND	ND	ND	ND	1,64E-13	7,79E-13	1,88E-10	0,00E+00	-2,07E-10
HTP-nc	CTUh	7,96E-09	1,67E-12	ND	ND	ND	ND	ND	ND	ND	ND	2,57E-12	4,16E-11	2,97E-09	0,00E+00	-4,10E-09
SQP	dimensionless	4,64E+01	1,59E-03	ND	ND	ND	ND	ND	ND	ND	ND	1,38E-03	3,98E-02	7,65E-01	0,00E+00	-4,77E-01
Acronyms	**GWP-GHG** = this indicator includes all greenhouse gases except biogenic uptake and emissions of carbon dioxide 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, **PM** = Potential incidence of disease due to PM emissions, **IRP** = Potential Human exposure efficiency relative to U235, **ETP-fw** = Potential Comparative Toxic Unit for ecosystems, **HTP-c** = Potential Comparative Toxic Unit for humans, **HTP-nc** = Potential Comparative Toxic Unit for humans, **SQP** = Potential soil quality index															

[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.

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	9,56E+00	4,39E-05	ND	ND	ND	ND	ND	ND	ND	ND	1,32E-04	1,10E-03	2,91E-01	0,00E+00	-5,37E-01
PERM	MJ	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	9,56E+00	4,39E-05	ND	ND	ND	ND	ND	ND	ND	ND	1,32E-04	1,10E-03	2,91E-01	0,00E+00	-5,37E-01
PENRE	MJ	3,76E+01	2,11E-04	ND	ND	ND	ND	ND	ND	ND	ND	8,16E-04	5,29E-03	1,73E+00	0,00E+00	-2,21E+01
PENRM	MJ	3,62E+01	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-2,17E+01
PENRT	MJ	7,37E+01	2,11E-04	ND	ND	ND	ND	ND	ND	ND	ND	8,16E-04	5,29E-03	1,73E+00	0,00E+00	-4,38E+01
SM	kg	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m^3	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

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

Additional environmental information - 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	6,79E-02	1,29E-04	ND	ND	ND	ND	ND	ND	ND	ND	1,42E-05	3,23E-03	5,13E-02	0,00E+00	-8,33E-03
Non-hazardous waste disposed	kg	3,48E-04	6,77E-08	ND	ND	ND	ND	ND	ND	ND	ND	1,96E-07	1,69E-06	3,67E-02	0,00E+00	-1,02E-04
Radioactive waste disposed	kg	1,72E-05	7,90E-10	ND	ND	ND	ND	ND	ND	ND	ND	2,19E-09	1,98E-08	1,36E-05	0,00E+00	-4,62E-06

Additional environmental information - 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	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	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	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	6,00E-01	0,00E+00	0,00E+00
Materials for energy recovery	kg	5,81E-04	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	4,50E-01	0,00E+00	0,00E+00
Exported energy, electricity	MJ	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-4,88E-01
Exported energy, thermal	MJ	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-1,42E+00

The result tables shall only contain values or the letters "ND" (Not Declared). It is not possible to specify ND for mandatory indicators. ND shall only be used for voluntary parameters that are not quantified because no data is available.

Other environmental performance indicators:

Additional environmental information

Differences versus previous versions

This is the first version of the EPD.

Abbreviations

Abbreviation	Definition
General abbreviations	
EN	European standard
EPD	Environmental product declaration
EF	Environmental footprint
GPI	General guidelines for the environmental labelling program (in the Czech Republic – NPEZ)
ISO	International Organization for Standardization
LCA	Life cycle assessment
LCI	Life cycle inventory analysis
LCIA	Life cycle impact assessment
DJ / DU	Declared unit
ILCD	International Reference Life cycle data system
PCR	Product category rules
c-PCR	Additional rules for product categories
PRICE	European Committee for Standardization
CPC	Central Product Classification (Central Product Classification)
GHS	Globally Harmonized System of Classification and Labelling of Chemicals
GRI	Global Reporting Initiative
National	Undeclared
Environmental impact indicators (EN 15804)	
Greenhouse gas	A gas in the atmosphere that absorbs and emits infrared radiation, thereby contributing to the warming of the planet (CO_2, CH_4, N_2O and others)
GWP	Global warming potential (kg CO_2 eq .)
GWP-fossil	Global warming potential from fossil fuels (kg CO_2 eq .)
GWP-biogenic	Global warming potential from biogenic sources (kg CO_2 eq .)
GWP- luluc	Global warming potential due to land use and land use change (kg CO_2 (eq .)
ODP	Stratospheric ozone depletion potential (kg CFC-11 equivalent)
AP	Acidification potential, cumulative exceedance (mol H^+ (eq .)
EP	Eutrophication potential
EP-freshwater	Freshwater eutrophication potential (kg P eq .)
EP-seawater	Seawater eutrophication potential (kg N eq .)
EP-soils	Land eutrophication potential (mol N eq .)
POCP	Ground-level ozone formation potential (kg NMVOC equivalent)
ADP	Potential for resource/raw material depletion
ADP - minerals and metals	Potential for depletion of non-fossil resources/raw materials (kg Sb equivalent)
ADP-fossil	Fossil resource/raw material depletion potential (MJ)
WDP	Water shortage potential (m^3)

Abbreviation	Definition
Additional environmental impact indicators (EN 15804)	
GWP-GHG	Global warming potential for greenhouse gases (kg CO_2 eq .). The indicator includes all greenhouse gases except biogenic uptake and emissions of carbon dioxide 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.
PM	Potential incidence of diseases due to particulate matter emissions
IRP	Potential effect of human exposure to the isotope U235
ETP- fw	Potential toxicity benchmark for ecosystems
HTP-c	Potential human toxicity comparator – carcinogenic effects
HTP- oc	Potential human toxicity comparator - non-carcinogenic effects
SQP	Potential Soil Quality Index
Resource utilization indicators	
PERE	Renewable primary energy consumption excluding energy sources used as raw materials (MJ)
PERM	Consumption of renewable primary energy sources used as raw materials (MJ)
PERT	Total consumption of renewable primary energy sources (primary energy and primary energy sources used as raw materials) (MJ)
PENRE	Consumption of non-renewable primary energy excluding energy sources used as raw materials (MJ)
PENRM	Consumption of non-renewable primary energy sources used as raw materials (MJ)
PENRT	Total consumption of non-renewable primary energy sources (primary energy and primary energy sources used as raw materials) (MJ)
SM	Consumption of secondary raw materials (kg)
RSF	Consumption of renewable secondary fuels (MJ)
NRSF	Consumption of non-renewable secondary fuels (MJ)
FW	Net drinking water consumption (m^3)
Waste indicators	
HWD	Hazardous waste removed (kg)
NHWD	Other waste removed (kg)
RWD	Radioactive waste removed (kg)
Output flow indicators	
CRU	Reusable building elements (kg)
MR	Materials to be recycled (kg)
MER	Materials for energy recovery (kg)
EEE	Exported energy, electricity (MJ)
EET	Exported thermal energy (MJ)
Lifecycle phases/modules	
A1	Mining and processing of raw materials, processing of input secondary raw materials
A2	Transport to the manufacturer
A3	Production
A4	Transport to the construction site
A5	Installation in a building
B1	Use or application of the installed product
B2	Maintenance

Abbreviation	Definition
B3	Repair
B4	Exchange
B5	Reconstruction
B6	Operating energy consumption
B7	Operating water consumption
C1	Deconstruction / Demolition
C2	Transportation to the waste processing site
C3	Waste treatment for reuse, recovery and/or recycling
C4	Removal
D	Reuse, recovery and recycling potential
Other relevant terms	
Substances of Very High Concern (SVHC)	Substances of very high concern
CAS number	An internationally recognized unique numerical code used in chemistry for chemical substances
CF	Characterization factor
RSL	Reference life span
MJ	Megajoule
kg	Kilogram
m^3	Cubic meter
NMVOC	methane volatile organic compounds
Sat eq .	Antimony equivalents
P eq .	Phosphorus equivalents
Not equal .	Nitrogen equivalents
Equivalent to CFC-11	Chlorofluorocarbon-11 equivalents
CO_2 equivalent	Carbon dioxide equivalents
kg C	Kilograms of carbon
kg CO_2 eq .	Kilograms of carbon dioxide equivalent
OTE	OTE, as (in the Czech Republic) – energy market operator

References

EN ISO 14025:2010 Environmental labels and declarations - Type III environmental declarations - Principles and procedures

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

EN ISO 14040:2006 Environmental management - Life Cycle Assessment - Principles and Framework

EN ISO 14044:2006 Environmental management - Life Cycle Assessment – Requirements and guidelines

EN ISO 14063:2020 Environmental management - Environmental communication - Guidelines and examples

EN 15643:2021 Sustainability of construction works - Framework for assessment of buildings and civil engineering works

EN 15941:2024 Sustainability of construction works - Data quality for environmental assessment of products and construction work - Selection and use of data

EN 15942:2021 Sustainability of construction works - Environmental product declarations - Communication format business-to-business

EN 17672:2022 Sustainability of construction works - Environmental product declarations - Horizontal rules for business-to-consumer communication

EN 16908:2017+A1:2022 Cement and building lime - Environmental product declarations - Product category rules complementary to EN 15804

EN 16449:2014 Wood and wood-based products - Calculation of the biogenic carbon content of wood and conversion to carbon dioxide

ILCD General guide for Life Cycle Assessment (2010) - JRC EU

Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives; CZ - Act No. 541/2020 Coll., as amended (Waste Act)

Decree No. 8/2021 Coll. Waste catalogue – Waste catalogue

Regulation (EC) No 1907/2006 of the European Parliament concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) and establishing a European Chemicals Agency - REACH (Registration, Evaluation and Authorisation of Chemicals

Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006

SimaPro LCA Package, Pré Consultants, the Netherlands, www.pre-sustainability.com

Ecoinvent Centre, www.Ecoinvent.org

EU PEF (EF reference package) - https://eplca.jrc.ec.europa.eu/LCDN/EN15804.html

Explanatory documents are available from the head of Technical Support of the EPD owner.

a. Note: If the CSN EN 15804 standard is not used as the PCR, it is necessary to state the basic valid PCR according to which the EPD was processed.

Independent verification of declarations and data in accordance with ČSN ISO 14025:2010

CEN standard EN 15804 serves as the Core Product Category Rules (PCR)

☐	intern	☒	extern

Third-party verifier [b]:

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Česká republika

Mgr. Miroslav Sedláček
Head of the certification body

the Certification Body No. 3018 accredited by Czech Accreditation Institute, o.p.s. according to ČSN EN ISO/IEC 17065:2013

[a] Product category rules
[b] Optional for business-to-business communications, mandatory for business-to-consumer communications (see ISO 14025:2006, clause 9.4).

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This document is a translation of the EPD issued in Czech. In case of doubt use the Czech version of this EPD as a reference.