Environmental Product Declaration

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

Vertical roof outlet with integrated PVC sleeve

An average product including sub-products of the same type.

from

TOPWET s.r.o.

TOPWET® SYSTÉMY ODVODNĚNÍ PLOCHÝCH STŘECH

Programme:	"National Environmental Labeling Program" - Czech Republic (NPEZ)
Programme operator:	Ministry of the Environment of the Czech Republic
Typ EPD	EPD of multiple products from a given company – average product
EPD registration number:	**3015-EPD-030068948**
Publication date:	2025-08-15
Valid until:	2030-08-15
	An EPD should provide current information and may be updated if conditions change.

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: *TOPWET s.r.o.*
Third-party verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☒ EPD verification by accredited certification body Third-party verification: ***Technický a zkušební ústav stavební Praha, s.p.*** is an approved certification body accountable for the third-party verification. 190 00 Praha 9, Prosecká 811/76a, CZ The certification body is accredited by: ***Českým institutem pro akreditaci, o.p.s., Osvědčení č. 456/2024*** Verifier: Ing. Lenka Vrbová TECHNICKÝ A ZKUŠEBNÍ ÚSTAV STAVEBNÍ PRAHA, s.p. Akreditovaný ZÚS Certifikační orgán č. 3015
Procedure for follow-up of data during EPD validity involves third party verifier: ☐Ano ☒ne

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: TOPWET s.r.o.

Náměstí Viléma Mrštíka 62, 664 81 Ostrovačice, CZ
IČO: 27377377
Contact:
Martin Pánek, martin.panek@topwet.cz, +420 720 970 740

Description of the organisation:

TOPWET s.r.o. is a Czech family-owned company with a long-standing tradition in the production of building elements and accessories. As the leading Czech manufacturer of drainage systems for flat roofs, TOPWET offers a comprehensive system for the drainage of flat roofs, terraces, and related components. A major highlight is their range of two-stage roof drains with integrated waterproofing membranes and scuppers with a lowered discharge edge.

TOPWET's products outperform competing solutions due to their optimal materials, particularly the use of polyamide PA6 for drain bodies, and innovative technical designs. This has earned the company international recognition, with products exported to markets like Germany and the USA.

The company's long-term collaboration with research departments at Brno University of Technology (VUT Brno), especially the Faculty of Civil Engineering (FAST VUT Brno), has led to the development of numerous proprietary products and technologies, some of which are protected by industrial design rights or patents.

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 specific type of product. A Declaration of Conformity is issued for each product.

Name and location of production site(s):

TOPWET s.r.o.
Náměstí Viléma Mrštíka 62, 664 81 Ostrovačice, CZ

Product information

Product name: Vertical roof outlet with integrated PVC sleeve

Product identification:

An average product including sub-products of the same type.

TW 75 S PVC	TWE 110 V ___	TWTE 110 S ___	TWO 110 ___	TWOP TUR 160 PVC
TW 110 S PVC	TWE 125 V ___	TWTE 125 S ___	TWO 125 ___	TWOP TUR 160 ___
TW 125 S PVC	TWN V220 PVC	TWT 50 V PVC	TWO 160 ___	TWP 50 PVC
TW 160 S XL PVC	TWN V300 PVC	TWT 75 V PVC	TWO 160 XL ___	TWP 75 PVC
TW 75 S ___	TWN V500 PVC	TWT 110 V PVC	TWO TUR 160 PVC	TWP 110 PVC
TW 110 S ___	TWN V300 XL PVC	TWT 125 V PVC	TWO TUR 160 ___	TWP 125 PVC
TW 125 S ___	TWN V500 XL PVC	TWT 50 V ___	TWOD 50 PVC	TWP 160 PVC
TW 160 S XL ___	TWN V220 ___	TWT 75 V ___	TWOD 75 PVC	TWP 50 ___
TWE 75 S PVC	TWN V300 ___	TWT 110 V ___	TWOD 110 PVC	TWP 75 ___
TWE 110 S PVC	TWN V500 ___	TWT 125 V ___	TWOD 125 PVC	TWP 110 ___
TWE 125 S PVC	TWN V300 XL ___	TWTE 50 V PVC	TWOD 160 PVC	TWP 125 ___
TWE 160 S XL PVC	TWN V500 XL ___	TWTE 75 V PVC	TWOD 50 ___	TWP 160 ___
TWE 75 S ___	TWNE V500 PVC	TWTE 110 V PVC	TWOD 75 ___	TW SAN 50 PVC
TWE 110 S ___	TWNE V500 ___	TWTE 125 V PVC	TWOD 110 ___	TW SAN 63 PVC
TWE 125 S ___	TWNE V500 XL PVC	TWTE 50 V ___	TWOD 125 ___	TW SAN 75 PVC
TWE 160 S XL ___	TWNE V500 XL ___	TWTE 75 V ___	TWOD 160 ___	TW SAN 90 PVC
TW 75 V PVC	TWT 75 S PVC	TWTE 110 V ___	TWOP 50 PVC	TW SAN 110 PVC
TW 110 V PVC	TWT 110 S PVC	TWTE 125 V ___	TWOP 75 PVC	TW SAN 125 PVC
TW 125 V PVC	TWT 125 S PVC	TWO 50 PVC	TWOP 110 PVC	TW SAN 140 PVC
TW 75 V ___	TWT 75 S ___	TWO 75 PVC	TWOP 125 PVC	TW SAN 160 XL PVC
TW 110 V ___	TWT 110 S ___	TWO 110 PVC	TWOP 160 PVC	TW SAN 50 ___
TW 125 V ___	TWT 125 S ___	TWO 125 PVC	TWOP 50 ___	TW SAN 63 ___
TWE 75 V PVC	TWTE 75 S PVC	TWO 160 PVC	TWOP 75 ___	TW SAN 75 ___
TWE 110 V PVC	TWTE 110 S PVC	TWO 160 XL PVC	TWOP 110 ___	TW SAN 90 ___
TWE 125 V PVC	TWTE 125 S PVC	TWO 50 ___	TWOP 125 ___	TW SAN 110 ___
TWE 75 V ___	TWTE 75 S ___	TWO 75 ___	TWOP 160 ___	TW SAN 125 ___

TW SAN 140 ___
TW SAN 160 XL ___
TWE SAN 50 PVC
TWE SAN 63 PVC
TWE SAN 75 PVC
TWE SAN 90 PVC
TWE SAN 110 PVC
TWE SAN 125 PVC
TWE SAN 140 PVC
TWE SAN 160 XL PVC
TWE SAN 50 ___
TWE SAN 63 ___
TWE SAN 75 ___
TWE SAN 90 ___
TWE SAN 110 ___
TWE SAN 125 ___
TWE SAN 140 ___
TWE SAN 160 XL ___
TW SAN BZ 50 PVC
TW SAN BZ 75 PVC
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TWOP SAN 125 ___
TWOP SAN 160 ___
TWB 50 S PVC
TWB 75 S PVC
TWB 50 S ___
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TWBE 50 S PVC
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TWBE 50 S ___
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TWJ BZ 90 ___
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TWC 125 ___
TWC 160 ___
TWCE 50 PVC
TWCE 75 PVC
TWCE 110 PVC
TWCE 125 PVC
TWCE 160 PVC
TWCE 50 ___
TWCE 75 ___
TWCE 110 ___
TWCE 125 ___
TWCE 160 ___
TWC 50x100 PVC
TWC 50x150 PVC
TWC 100x100 PVC
TWC 150x150 PVC
TWC 100x300 PVC
TWC 50x100 ___
TWC 50x150 ___
TWC 100x100 ___
TWC 150x150 ___
TWC 100x300 ___

TWPP 50 PVC

TWPP 75 PVC
TWPP 110 PVC
TWPP 125 PVC
TWPP 50 ___
TWPP 75 ___
TWPP 110 ___
TWPP 125 ___
TWPP 50x100 PVC
TWPP 50x150 PVC
TWPP 100x100 PVC
TWPP 150x150 PVC
TWPP 100x300 PVC
TWPP 50x100 ___
TWPP 50x150 ___
TWPP 100x100 ___
TWPP 150x150 ___
TWPP 100x300 ___
TWC 40 MINI PVC
TWC 40 MINI ___
TWC 50x0 PVC
TWC 75x0 PVC
TWC 110x0 PVC
TWC 125x0 PVC
TWC 160x0 PVC
TWC 50x0 ___
TWC 75x0 ___
TWC 110x0 ___
TWC 125x0 ___
TWC 160x0 ___

Product description:

The TOPWET roof drain with an integrated PVC-based waterproofing membrane is designed in a vertical version with an outer diameter of 110 mm. It features thermal insulation with a double-wall design and includes a protective basket. The drain is used for the drainage of flat roofs and terraces. The integrated PVC waterproofing membrane ensures a safe and reliable connection to the roof's waterproofing layer. A heated variant of the roof drain prevents freezing and clogging, providing reliable water drainage from the roof even at sub-zero temperatures. All drains are equipped with a protective basket to prevent clogging by debris. The product complies with standard EN 1253-2 Gullies for buildings - Part 2: Roof drains and floor gullies without trap.

UN CPC code:

36320 Pipes, hoses and their fittings, of plastics

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:

Each drain is packed in an LDPE bag. In the case of a larger quantity of pieces, they are placed in a cardboard box of 5 pieces. When sold on pallets, 12 boxes are placed on a pallet.

Environment and health during use

During the entire production process, it is not necessary to take any special health protection measures beyond the legally specified industrial protection measures for production employees.

LCA information

Functional unit / declared unit:

The declared unit is 1 kg of the average manufactured product – Vertical roof outlet with integrated PVC sleeve.

An average product including sub-products of the same type.

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

Reference service life:
The reference service life is not declared. However, considering the high-quality materials used and the emphasis on durability, it can be expected that TOPWET roof drains will have a service life comparable to or even longer than the roof covering itself, i.e. several decades, provided proper installation and maintenance are ensured. It can therefore be stated that the service life of the drain is limited by the service life of the structure in which the product is installed.
Time representativeness:
For specific data, the manufacturer's data for the **year 2024** 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: 0.526 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 16-24 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 environmental impact is assumed to be very small and can be neglected.
- **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 7.5 - 16

t (EURO 6) to an inert material landfill as a demolition of a mixed building, estimated transport distance according to calculations: 25 km to the 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 100% of the product after disassembly and sorting is used for energy recovery (ZEVO). The costs of crushing mixed plastic and emissions from combustion are included. The burdens from the treatment and disposal of product packaging are also included.
- **C4,** Waste disposal including pre-treatment and management of the disposal site. Landfilling of the product is not expected.

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 heat from combustion is taken into account (without considering emissions).

Production:

Semi-finished Roof Drain

PA6 granulate is poured into a hopper. From the hopper, the material enters a heated barrel containing a rotating screw. The screw conveys the granulate forward while melting and homogenizing it through friction and the heat of the barrel's heating bands. The molten plastic is then injected under pressure into the mold cavity. Injection speed and pressure are critical for properly filling the mold and ensuring the quality of the part. After the mold is filled, the holding pressure phase follows. Since plastic shrinks as it cools, pressure must be maintained on the melt in the mold cavity to compensate for shrinkage and to prevent sink marks or incomplete filling.
The mold is equipped with cooling channels through which water flows, ensuring rapid and uniform cooling of the plastic, which is essential for dimensional stability and minimizing internal stresses. The plastic in the mold cavity solidifies and takes its final shape. The mold opens, the semi-finished product is ejected, and the cycle repeats.

Preparation of the Semi-finished Product for Membrane Application

Before the actual assembly of the roof drain, the semi-finished products must be carefully sanded with sandpaper. This applies to all contact surfaces where the waterproofing membrane will be placed or where pipe sections will be fitted. All semi-finished products must be dry, degreased, and their anchoring holes covered with temporary adhesive labels. Pipe contact surfaces are not sanded. Pipe ends must be flat, free of burrs, and cleared of any cutting residues.

Application of the PVC Membrane

First, solvent is applied to the contact surfaces of the membrane, followed by a technological pause for ventilation. Adhesive is then applied to the contact surfaces of the semi-finished product using a notched trowel or a foam roller. The membrane is placed onto the semi-finished product and centered using the protruding pins. Using a rubber roller, the membrane is firmly pressed against the semi-finished product to eliminate all air bubbles. In a pneumatic press, the membrane and semi-finished product are pressed together using a pressing fixture. After pressing, a technological pause follows for the initial curing of the bond.

Assembly and Completion of the Flange

Adhesive is applied again along the entire perimeter of the semi-finished product already bonded with the membrane. The edge of the membrane that will be under the flange is heated with a hot air gun. Adhesive (Sika) is also applied along the entire perimeter of the flange contact surface. The flange is then placed onto the semi-finished product and centered using protruding pins or dowels. In a pneumatic press, the flange is pressed using a pressing fixture.
An ultrasonic welding machine is then used to create a weld on all protruding pins. Excess material created during welding is removed with a chisel. Finally, paint is applied along the entire perimeter of the flange to seal the joint with the membrane.

The finished part is then labeled with a production tag. Before packaging, a technological pause of at least 12 hours is required to ensure complete curing and stabilization of all joints.

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%. Production 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
Polyamide	73,9	0	0
PVC film	24,3	0	0
Elastomer	0,8	0	0
Chemical components	0,7	0	1,07E-03
Other components (steel)	0,3	0	0
TOTAL	100	0	1,07E-03
Packaging materials	**Weight %**	**Weight-% (versus the product)**	**Biogenic carbon content in kg C/DU**
Paper and cardboard	28,8	12,0	5,42E-02
Packaging foil	6,9	2,9	0
Pallets	64,2	26,8	1,20E-01
TOTAL	100	41,8	1,74E-01

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.	8,83E+00	1,84E-03	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,89E-03	3,48E-01	0,00E+00	-1,58E+00
GWP-biogenic	kg CO_2 ekv.	3,98E-02	8,43E-07	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,70E-06	1,12E+00	0,00E+00	-7,97E-04
GWP- luluc	kg CO_2 ekv.	4,25E-03	5,74E-07	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,84E-06	1,27E-05	0,00E+00	-1,11E-04
GWP - total	kg CO_2 ekv.	8,87E+00	1,84E-03	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,90E-03	1,46E+00	0,00E+00	-1,59E+00
ODP	kg CFC 11 ekv.	1,60E-07	4,04E-11	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,29E-10	3,52E-10	0,00E+00	-6,78E-08
AP	mol H^+ ekv.	2,61E-02	3,73E-06	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,20E-05	1,18E-03	0,00E+00	-1,31E-03
EP-freshwater	kg P ekv.	4,00E-03	1,24E-07	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,96E-07	5,05E-05	0,00E+00	-3,27E-05
EP- marine	kg N ekv.	6,60E-03	8,82E-07	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,83E-06	9,28E-04	0,00E+00	-4,56E-04
EP - terrestrial	mol N ekv.	6,29E-02	9,52E-06	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,05E-05	6,27E-03	0,00E+00	-4,81E-03
POCP	kg NMVOC ekv.	1,74E-02	5,97E-06	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,91E-05	1,52E-03	0,00E+00	-2,55E-03
ADP- minerals& metals*	kg Sb ekv.	4,70E-06	6,28E-09	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,01E-08	5,05E-08	0,00E+00	-5,05E-07
ADP-fosil*	MJ	1,51E+02	2,59E-02	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	8,31E-02	2,90E-01	0,00E+00	-2,44E+01
WDP*	m^3	-6,36E+00	9,21E-05	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,95E-04	4,50E-03	0,00E+00	-2,44E-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															

** 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.	8,87E+00	1,84E-03	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,90E-03	3,49E-01	0,00E+00	-1,58E+00
PM	Disease incidence	1,62E-07	1,16E-10	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,71E-10	1,11E-08	0,00E+00	-6,79E-09
IRP	kBq U235 ekv.	1,35E+00	3,77E-05	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,21E-04	1,72E-03	0,00E+00	-1,18E-02
ETP- fw	CTUe	1,95E+01	3,77E-03	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,21E-02	1,43E+00	0,00E+00	-7,29E-01
HTP-c	CTUh	2,37E-07	2,84E-13	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	9,10E-13	1,55E-10	0,00E+00	-1,97E-10
HTP- nc	CTUh	1,39E-07	1,50E-11	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,82E-11	5,10E-09	0,00E+00	-1,66E-09
SQP	dimensionless	4,25E+01	1,32E-02	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,23E-02	2,85E-01	0,00E+00	-3,50E-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	1,06E+01	4,74E-04	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,52E-03	1,52E-03	0,00E+00	-1,39E-01
PERM	MJ	5,79E-02	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	1,07E+01	4,74E-04	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,52E-03	1,58E-02	0,00E+00	-1,39E-01
PENRE	MJ	1,30E+02	2,00E-03	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,40E-03	6,62E-02	0,00E+00	-4,93E-01
PENRM	MJ	3,65E-01	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
PENRT	MJ	1,30E+02	2,00E-03	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,40E-03	6,62E-02	0,00E+00	-4,93E-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	5,63E-03	1,05E-03	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,94E-06	3,59E-01	0,00E+00	-1,58E-04
Non-hazardous waste disposed	kg	2,70E-01	6,04E-07	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,37E-03	4,04E-02	0,00E+00	-1,53E-02
Radioactive waste disposed	kg	2,76E-04	9,37E-09	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,00E-08	4,39E-07	0,00E+00	-2,93E-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	1,05E-02	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	1,49E-01	0,00E+00	0,00E+00
Materials for energy recovery	kg	1,22E-02	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	2,68E-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	-5,72E-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	-1,62E+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)
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 $CO2_{is}$ set to zero.

Abbreviation	Definition
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
B3	Repair
B4	Exchange
B5	Reconstruction
B6	Operating energy consumption

Abbreviation	Definition
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
m³	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.