Environmental Product Declaration

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

Altech Flexi Connection Hose for Tap Water Systems 1200mm / Altech Flexi anslutningsslangar för tappvattensystem 1200mm

from

Saint-Gobain Distribution Sweden AB

Program:	The International EPD System, www.environdec.com
Program operator:	EPD International AB
Type of EPD:	EPD on multiple products, based on a representative product
EPD registration number:	EPD-IES-0026239:001
Version date:	2025-11-10
Validity date:	2030-11-09

An EPD may be updated or depublished if conditions change. To find the latest version of the EPD and to confirm its validity, see www.environdec.com

General information

Programme information

Programme:	The International EPD System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
E-mail:	support@environdec.com

PCR and verification

Product Category Rules (PCR):
CEN standard EN 15804:2012+A2:2019/AC:2021 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): Construction Products PCR 2019:14 version 2.0.1
PCR review was conducted by: PCR review was conducted by the Technical Committee of the International EPD® System. See https://environdec.com/about-us/the-international-epd-system-about-the-system for a list of members. Review chair: Rob Rouwette. The review panel may be contacted via the Secretariat www.environdec.com/contact.
Life Cycle Assessment (LCA)
LCA accountability: Fanni Végvári, CarbonZero AB
Third-party verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☒ **Individual EPD verification without a pre-verified LCA/EPD tool** Third-party verifier: Stephen Forson, ViridisPride 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 published in different EPD programmes, may not be comparable. For two EPDs to be comparable, they shall be based on the same PCR (including the same first-digit 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 identical scope in terms of included life-cycle stages (unless the excluded life-cycle stage is demonstrated to be insignificant); apply identical impact assessment methods (including the same version of characterisation factors); and be valid at the time of comparison.

For further information about comparability, see EN 15804 and ISO 14025.

Information about EPD owner

Owner of the EPD	Saint-Gobain Distribution Sweden AB Bryggerivägen 9 168 67 Bromma Stockholm
Contact	SGDS - Beriar Maroof (beriar.maroof@saint-gobain.se)
Description of the organisation	Saint-Gobain Distribution Sweden AB - specialists in collaboration for more efficient business in construction and installation. Saint-Gobain Distribution Sweden AB is the head company of some of Sweden's leading trading companies in construction, sheet metal, tiles and installation. All the companies have long and solid industry experience and provide most of Sweden's craftsmen with materials for various projects. Customers in different companies can also buy support items from the sister companies in the group, and in selected cases, we take joint projects to facilitate the logistics of the supply of goods, which is then often critical for a smooth construction project. • Optimera - construction trade for professional carpenters • Dahl – heat, plumbing and sanitary specialist • Bevego - building sheet metal, ventilation and technical insulation • Kakelspecialisten and Konradsson's Tiles - tiles, tiling and bathroom fittings The company's focus is on sales and services with direct contact to about 150,000 customers regularly. Saint-Gobain Distribution Sweden AB is owned by Saint-Gobain with a presence in 64 countries and over 190 000 employees worldwide.

Product information

Product name	Altech Flexi Connection Hose / Altech flexibla anslutningsslangar
Product identification	Connecting hoses
UN CPC code	4129 - Tubes, pipes and hollow profiles of cast-iron and cast-steel and related fittings; tube or pipe fittings of steel other than cast
Product description	Altech Flexi Connection Hose for tap water systems. The product is available in different, sizes, lengths and connection types. This EPD covers connecting hoses with the lengths of 1200 – 4000 mm.
Location of production site	Aydemir, Bulgaria
Technical data	Hose made of PE-RT with stainless steel braiding. Temperature range: 0–70 °C. Temporary maximum temperature: 90 °C. For more technical specifications, please visit https://www.dahl.se/ or https://www.dahl.no/.
Use	Altech Flexi Connection Hoses are for potable water, designed for safe and hygienic installations.

Products included in this study

Product name	Geographical scope	Article number	Product image	Website
ALT FLEXISLAN TAPPV R G15X1,2M	Sweden	5060935		https://www.dahl.se/
ALT FLEXISLAN TAPPV R G15X1,5M		5060936		
ALT FLEXISLAN TAPPV R G15X2M		5060937		
ALT FLEXSLAN TAPPV RV G15X1,2M		5060939		
ALT FLEXSLAN TAPPV RV G15X1,5M		5060941		
ALT FLEXISL TAPPV G15XG20X1,5M		5060942		
ALT FLEXSLAN TAPPV RV G15X2,0M		5060943		
ALT FLEXISL TAPPV G15XG20X2,0M		5060944		
ALT FLEXISL TAPPV G15XG20X1,2M		5060956		
AL FLEXIS TAPPV R 22 MM 1,2 M		**8192001**		
Altech fleksibel trykkslange 1/2"V x 1/2"R x1200mm	Norway	9301622		https://www.dahl.no/
Altech fleksibel trykkslange 1/2"R x 3/4"V x1200mm		9301624		

Altech fleksibel trykkslange 3/4"V x 3/4"R x1200mm		9301626		
Altech fleksibel trykkslange 1/2"V x 1/2"R x1500mm		9301627		
Altech fleksibel trykkslange 1/2"R x 3/4"V x1500mm		9301629		
Altech fleksibel trykkslange 3/4"V x 3/4"R x1500mm		9301632		
Altech fleksibel trykkslange 1/2"V x 1/2"R x2000mm		9301633		
Altech fleksibel trykkslange 1/2"R x 3/4"V x2000mm		9301634		
Altech fleksibel trykkslange 3/4"V x 3/4"R x2000mm		9301636		
Altech fleksibel trykkslange 1/2"V x 1/2"V x1200mm		9301623		
Altech fleksibel trykkslange 1/2"V x 3/4"V x1200mm		9301625		
Altech fleksibel trykkslange 1/2"V x 1/2"V x1500mm		9301628		
Altech fleksibel trykkslange 1/2"V x 3/4"V x1500mm		9301631		
Altech fleksibel trykkslange 1/2"V x 3/4"V x2000mm		9301635		
Altech fleksibel trykkslange 3/4"vx3/4"vx1200mm		9301775		
Altech fleksibel trykkslange 3/4"vx3/4"vx1500mm		9301779		
Fleksibel trykkslange DN8 3/4"V x 3/4"V, 2000mm		9301784		

Products produced with same material setup, in same manufacturing plant are covered by this EPD.

This EPD covers multiple products, with a representative product that was determined amongst the LCA practitioner, manufacturer and EPD owner. The EPD covers the products in the table above and as per the declared unit of 1 kg of product, the material composition and manufacturing processes are similar enough to assume that the environmental impact remains the same across all products. The representative product is bolded in the table.

Content declaration of representative product

Product composition	Amount (kg)	Post-consumer recycled material, mass-% of product	Biogenic material, mass-% of product	Biogenic material[1], kg C/declared unit
Brass	1,08E-01	0	0	0
Polyethylene	8,16E-02	0	0	0
Stainless steel	3,29E-01	0	0	0
Total	**5,18E-01**	***0***	***0***	***0***
Packaging composition	**Weight, kg**	**Weight-% (versus the product)**	**Biogenic material, mass-% of packaging**	**Biogenic material[1], kg C/declared unit**
PP	5,40E-03	1,04	0	0
Cardboard	3,85E-02	7,43	45	0,017
Pallet	6,25E-02	12,06	47,2	0,030
Total	**1,06E-01**	**20,53**	**44,40**	**0,047**

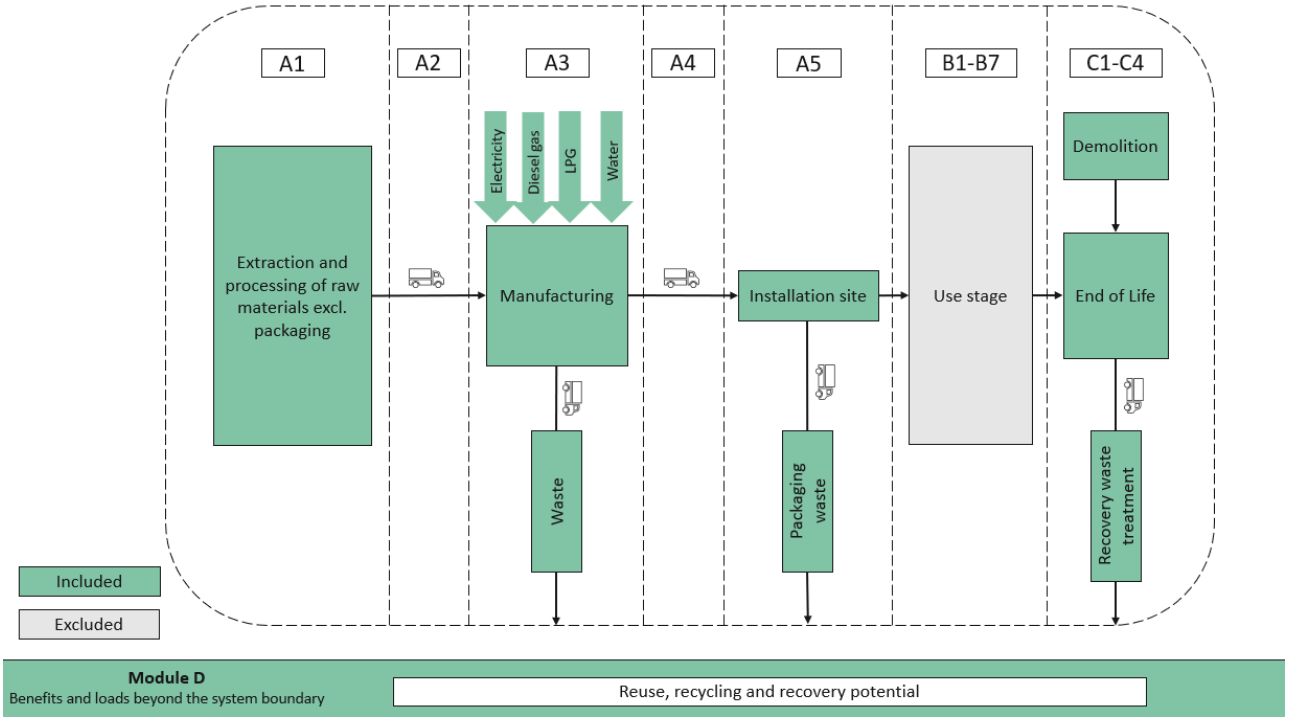
Hazardous substances from the candidate list of SVHC	EC No.	CAS No.	Mass-% per declared unit
Lead (in brass)	231-100-4	7439-92-1	<1%

In this study, lead is a hazardous or toxic material or substance that is included in the product that is in the candidate list of Substances of Very High Concern (SVHCs) which exceeds the limits for registration with the European Chemicals Agency (i.e., if the substance constitutes more than 0.1% of the weight of the product or any component of the product, if applicable).

[1] 1 kg biogenic carbon in the product/packaging is equal to 44/12 kg of CO_2 uptake

LCA information

Declared unit	1 pce of Altech connecting hoses / Alterna flexibla anslutninggslangar
Reference service life	Not applicable as module B is not included
Technical lifespan	30 years
Time representativeness	The data used to model product manufacturing correspond to 2024. The data from generic databases are from 2021 – 2024. No data used is older than 5 years.
Geographical scope	Modules A1-A2 are representative of a Global scope, A3 Bulgaria and A4-A5, C1-C4 and D Nordics.
Database(s) and LCA software used	Calculation completed in LCA for Experts v10.9.1.19 with an integrated ecoinvent database 3.11
System boundaries	Cradle to gate, with options (A1-A3, A4-A5, C1-C4 & D)
Process flow diagram	



More information
The EPD covers connecting hoses with different lengths. The products are sold in the Nordics.

A1, Raw material supply
This module considers the extraction and processing of all raw materials, energy, and transportation which occur upstream to the studied manufacturing process. The product mainly consists of metals and plastic. Generic data has been used to model the production of the materials that make up the products.

A2, transport to the manufacturer
The raw materials are transported to the manufacturing site where the production takes place. Specific data from the manufacturers' suppliers has been considered.

A3, manufacturing
This module includes the assembly of Altech connecting hoses / Altech flexibla anslutningsslangar manufactured in Bulgaria. During the production processes electricity, diesel, LPG and water are used. It is assumed that the inputs and outputs from this module are distributed equally across the products per declared unit as the processes are the same across all products. This module also includes the packaging materials which are used to transport the finished products to the distribution center. The packaging material consists of cardboard, PP and pallet. Data has been collected by the manufacturer from the production year 2024, the full 12 months from January 2024 to December 2024. This module also includes the transportation between the manufacturing factory in Bulgaria to Saint-Gobain distribution centers in the Nordics, which is calculated using Google Maps.

Transportation type	Distance (km)
Truck	2 900
Ship	50

Electricity used in manufacturing:
The electricity used in the modelling is based on the energy mix of Bulgaria from Association of Issuing Bodies (2023). The GWP-GHG values for the manufacturing stage impacts are 0,493 kg CO_2-eq./kWh.

A4, Transport
This stage includes transportation from Saint-Gobain's distribution centers in the Nordics out to the installation sites. The transportation distance to the installation sites is based on an average representative transportation of 1000 km.

Scenario information	Unit (expressed per declared unit)
Fuel type and consumption of vehicle or vehicle type used for transport e.g. long distance truck, boat etc.	Average truck trailer with a 27 t payload and 0,019 l/tkm diesel
Distance	1000 km
Capacity utilization (including empty returns)	61% for truck
Volume capacity utilization factor (factor: =1 or <1 or 1 for compressed or nested packaged products	Not applicable

A5, Construction installation
It has been assumed that the installation is done by hand and therefore has negligible impact. This stage also includes the waste management of the packaging that arises on the installation site. The waste rates of the different packaging materials are based on Swedish Statistics (SCB, 2020) which has been identified to be representative for the whole Nordics.

Material	Recycling (%)	Incineration (%)	Landfill (%)
Biogenic material	0	100	0
Plastic	26	74	0

B1-B7 Use stage
This stage is not declared.

C1 Deconstruction/Demolition
This stage includes the de-construction of Altech connecting hoses / Altech flexibla anslutningsslangar. The deconstruction is modelled according to the default values from Table 4 in PCR 2019:14 version 2.0.1 for modelling the end-of-life scenarios. The modelling consists of usage of diesel (1,1 kWh).

C2 Transport
This module represents the transport distance to the waste processing facility. It is assumed that the transportation distance to the waste processing facility is 50 km.

C3 Waste processing
This module includes any waste treatment needed from recycling and incineration.

C4 Final disposal
This module includes any material that is landfilled.

Processes	Unit (expressed per declared unit)
Collection process specified by type	0,518 kg collected
	0 kg collected with mixed construction waste
Recovery system specified by type	0 kg for re-use
	0,436 kg for recycling
	0,060 kg for energy recovery
Disposal specified by type	0,022 kg product or material for final deposition
Assumptions for scenario development, e.g. transportation	The transportation is modelled with an average truck trailer with a 27 t payload and 0,019 t/km

100% scenarios

In addition to the most probable end-of-life stage scenario, 100% scenarios have been modelled to give other perspectives. As the most probable end-of-life scenario is based on Swedish statistics (which is similar to Nordics statistics), this information can be used to calculate another end-of-life scenario. The 100% scenarios have been modelled in accordance with the default values given in table 4 of PCR2019:14 Version 2.0, to complement other processes in the end-of-life stage. Values for the end-of-life stage for the 100% scenarios are described in the table below.

Module	**Processes**	**Energy carrier**	**Quantity [kWh/tonne]**	**Weight considered [kg]**
C1	Demolition/deconstruction of concrete/reinforced concrete	Diesel	10	0
	Demolition/deconstruction of masonry, tiles and paver blocks	Diesel	5	0
	Demolition/deconstruction of steel, wood and other materials	Diesel	1.1	0,518
Module	**Processes**	**Distance [km]**	**Weight considered [kg]**	
C2	Transports (for materials not to be incinerated)	80	0,458	
	Transports (for materials to be incinerated)	130	0,060	
Module	**Processes**	**Energy carrier**	**Quantity [kWh/tonne]**	**Weight considered [kg]**
C3	Loading and unloading at sorting facility	Diesel	1.8	0,518
	Mechanical sorting	Electricity	2.2	0,518
	Crushing of concrete	Diesel	2.0	0
	Crushing of masonry, tiles and paver blocks	Diesel	1.5	0
	Fragging of steel	Diesel	7.4	0,416
	Chipping of wood	Diesel	6.0	0
	Treatment of other materials	Diesel	0.8	0,080
C4	Compacting of inert construction waste for landfills (including backfilling)	Diesel	1.6	0,022

D Benefits and loads beyond the system boundary

This module includes loads and benefits obtained from energy recovery and/or recycling materials.

Omissions of life cycle stages

The following flows were excluded from the system boundary:

- **A1-A3**: The plants, production of machines and transportation systems are excluded since the related flows are supposed to be negligible compared to the potential environmental impacts through the life cycle of the product
- **B1-B7**: The use phase of the products is not included

In addition, the following flows are excluded from the system boundaries:

- Flows related to human activities, such as employee transport

Cut-off criteria

The following procedures were followed for the exclusion of inputs and output.

- All input and output flows in a unit process were considered i.e., taking into account the value of all flows in the unit process and the corresponding LCI where data was available
- Data gaps were filled by conservative assumptions with average or generic data. Any assumptions in such cases were documented
- The use of cut-off criterion on mass inputs and primary energy at the unit process level (1%) and at the information module level (5%)

All hazardous and toxic materials and substances are included in the inventory, and the cut-off rules do not apply.

Allocation

Allocation criteria are based on mass.

Modules declared and geographical scope

	Product stage			Assembly stage		Use stage							End of life stage				Benefits & loads beoyond system boundary
	Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Modules	**A1**	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Modules declared	X	X	X	X	X	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	GLO	GLO	BG	NORD	NORD	-	-	-	-	-	-	-	NORD	NORD	NORD	NORD	NORD
Specific data used	6,89%*			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation products	25%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation sites	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-

*The specific data is based on the amount of impact that derives from the impact indicator GWP-GHG for modules A1-A3.

Declaration of data sources, reference years, and share of primary data:

Process	Source type	Source	Reference year	Data category	Share of primary data, of GWP-GHG results for A1-A3
Manufacturing of product	Collected data	EPD owner	2021-2024	Primary data	0,44%
Transport of components to production site	Collected data	EPD owner, ecoinvent 3.11	2021-2022	Primary data	3,51%
Transport of product to SGDS	Collected data	EPD owner, ecoinvent 3.11	2021-2022	Primary data	2,94%
Production of components	Database	ecoinvent v3.11, Shpera	2010-2024	Representative generic data	0%
Production of packaging	Database	ecoinvent v3.11, Shpera	2021-2024	Representative generic data	0%
Other processes	Database	ecoinvent v3.11, Shpera	2021-2024	Representative generic data, proxy data	0%
Total share of primary data, of GWP-GHG results for A1-A3	6,89%				

Summary of data quality:
The data quality detailed above is considered being good as majority of the data has been collected by the manufacturer, but the datasets used represent a fair geographical scope due to unavailable datasets. As majority of that data has the largest contribution to the climate impact of the products, the data quality has been deemed good.

Environmental Performance

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. As module C is included in the EPD, it is discouraging the use of the results of modules A1-A3 without considering the results of module C.

Mandatory impact category indicators according to EN 15804, EF 3.1

Results per declared unit: 1 kg									
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	kg CO2 eq	1,59E+00	4,92E-02	1,85E-01	2,26E-04	4,22E-03	7,71E-03	2,28E-01	-9,57E-01
GWP-fossil	kg CO2 eq	1,75E+00	4,85E-02	1,33E-02	2,26E-04	4,16E-03	7,25E-03	2,28E-01	-9,53E-01
GWP-biogenic	kg CO2 eq	-1,67E-01	1,16E-04	1,72E-01	2,51E-08	9,95E-06	4,52E-04	9,32E-06	-1,80E-03
GWP-luluc	kg CO2 eq	4,48E-03	4,98E-04	9,43E-06	2,32E-08	4,27E-05	6,42E-06	3,68E-06	-1,68E-03
ODP	kg CFC-11 eq	1,00E-08	8,03E-15	3,03E-12	3,36E-12	6,89E-16	8,13E-11	7,72E-14	7,20E-13
AP	mole H+ eq	4,91E-02	1,05E-04	3,55E-05	2,02E-06	9,01E-06	3,51E-05	2,64E-05	-2,17E-03
EP-freshwater	kg P eq	3,82E-03	1,31E-07	6,11E-08	7,30E-09	1,12E-08	1,12E-06	2,48E-09	-3,61E-07
EP-marine	kg N eq	3,84E-03	4,64E-05	1,18E-05	9,43E-07	3,98E-06	1,66E-05	5,80E-06	-3,65E-04
EP-terrestrial	mole N eq	4,76E-02	4,98E-04	1,54E-04	1,03E-05	4,27E-05	1,42E-04	1,18E-04	-3,35E-03
POCP	kg NMVOC eq	1,35E-02	9,48E-05	3,15E-05	3,08E-06	8,13E-06	4,67E-05	1,73E-05	-1,43E-03
ADP-minerals & metals[2]	kg Sb eq	6,12E-04	3,22E-09	1,73E-09	8,08E-11	2,76E-10	2,83E-08	1,83E-10	-4,82E-06
ADP-fossil[2]	MJ	2,82E+01	6,22E-01	5,54E-02	2,92E-03	5,34E-02	9,38E-02	3,59E-02	-1,08E+01
WDP[2]	m3	9,56E-01	2,21E-04	1,89E-02	8,91E-06	1,90E-05	1,31E-03	2,11E-02	-6,58E-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								

[2] The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator

Resource use indicators

Results per declared unit: 1 kg									
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	4,46E+00	4,67E-02	1,27E-02	1,85E-05	4,01E-03	9,27E-03	8,86E-03	-7,15E-01
PERM	MJ	1,94E+00	0,00E+00	-1,94E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	6,40E+00	4,67E-02	-1,93E+00	1,85E-05	4,01E-03	9,27E-03	8,86E-03	-7,15E-01
PENRE	MJ	2,82E+01	6,22E-01	5,54E-02	2,92E-03	5,34E-02	9,38E-02	3,59E-02	-1,08E+01
PENRM	MJ	4,03E+00	0,00E+00	-2,40E-01	0,00E+00	0,00E+00	0,00E+00	-3,79E+00	0,00E+00
PENRT	MJ	3,22E+01	6,22E-01	-1,85E-01	2,92E-03	5,34E-02	9,38E-02	-3,75E+00	-1,08E+01
SM	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m3	2,29E-02	2,31E-05	4,45E-04	2,08E-07	1,98E-06	3,25E-05	4,94E-04	-8,75E-02
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 mandatory and voluntary impact category indicators

Results per declared unit: 1 kg									
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-GHG[3]	kg CO2 eq	1,76E+00	4,92E-02	1,34E-02	2,26E-04	4,22E-03	7,67E-03	2,28E-01	-9,58E-01
Acronyms	**GWP-GHG** = global warming potential - greenhouse gases								

Waste indicators

Results per declared unit: 1 kg									
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
HWD	kg	2,60E-01	2,49E-11	1,94E-05	2,61E-06	2,13E-12	3,86E-04	4,88E-08	-6,84E-08
NHWD	kg	1,34E+00	8,65E-05	5,07E-03	1,93E-05	7,41E-06	9,38E-03	2,18E-02	9,74E-02
RWD	kg	9,86E-05	1,17E-06	2,37E-06	0,00E+00	1,00E-07	1,34E-06	1,66E-06	-2,67E-04
Acronyms	**HW** = Hazardous waste disposed; **NHW** = Non-hazardous waste disposed; **RW** = Radioactive waste disposed								

[3] 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 CO2 is set to zero

Output flow indicators

Results per declared unit: 1 kg									
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
CRU	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	2,64E-03	0,00E+00	1,35E-03	0,00E+00	0,00E+00	4,36E-01	0,00E+00	0,00E+00
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	MJ	0,00E+00	0,00E+00	2,41E-01	0,00E+00	0,00E+00	0,00E+00	4,86E-01	0,00E+00
EET	MJ	0,00E+00	0,00E+00	4,36E-01	0,00E+00	0,00E+00	0,00E+00	8,65E-01	0,00E+00
Acronyms	**CRU** = Components for reuse; **MFR** = Materials for recycling; **MER** = Materials for energy recovery; **EEE** = Exported electric energy; **ETE** = Exported thermal energy								

Information on biogenic carbon content

Biogenic carbon content	**Unit per declared unit**	**Amount**
Biogenic carbon content in product	kg C	0,00E+00
Biogenic carbon content in packaging	kg C	4,70E-02

1 kg biogenic carbon is equivalent to 44/12 kg CO2.

Additional Environmental Information

In addition to the most probable scenario, results from the corresponding 100% scenarios are added in this section.

Mandatory impact category indicators according to EN 15804, EF 3.1

Results per declared unit: 1 kg														
Indicator	**Unit**	**C1 100%**	**C2 100% RC**	**C2 100% INC**	**C2 100% LF**	**C3 100% RC**	**C3 100% INC**	**C3 100% LD**	**C4 100% RC**	**C4 100% INC**	**C4 100% LF**	**D 100% RC**	**D 100% INC**	**D 100% LF**
GWP-total	kg CO2 eq	1,88E-04	3,26E-03	-1,83E-01	-1,80E-01	1,98E-02	4,39E-01	0,00E+00	0,00E+00	0,00E+00	1,19E-02	-7,72E-01	-7,20E-02	0,00E+00
GWP-fossil	kg CO2 eq	1,88E-04	3,22E-03	8,24E-04	3,22E-03	1,83E-02	2,55E-01	0,00E+00	0,00E+00	0,00E+00	1,18E-02	-7,72E-01	-6,94E-02	0,00E+00
GWP-biogenic	kg CO2 eq	2,08E-08	7,72E-06	-1,83E-01	-1,83E-01	1,43E-03	1,83E-01	0,00E+00	0,00E+00	0,00E+00	3,63E-05	-4,59E-05	-1,43E-03	0,00E+00
GWP-luluc	kg CO2 eq	1,92E-08	3,30E-05	8,44E-06	3,30E-05	1,69E-05	2,36E-06	0,00E+00	0,00E+00	0,00E+00	3,59E-05	-1,54E-04	-1,16E-03	0,00E+00
ODP	kg CFC-11 eq	2,79E-12	5,34E-16	1,36E-16	5,34E-16	2,04E-10	9,01E-13	0,00E+00	0,00E+00	0,00E+00	1,27E-12	6,22E-13	-2,22E-13	0,00E+00
AP	mole H+ eq	1,68E-06	6,99E-06	1,79E-06	6,99E-06	7,61E-05	2,64E-05	0,00E+00	0,00E+00	0,00E+00	7,36E-05	-1,86E-03	-5,59E-05	0,00E+00
EP-freshwater	kg P eq	6,06E-09	8,65E-09	2,22E-09	8,65E-09	3,46E-06	3,78E-09	0,00E+00	0,00E+00	0,00E+00	1,39E-06	-4,08E-07	-6,37E-08	0,00E+00
EP-marine	kg N eq	7,82E-07	3,08E-06	7,87E-07	3,08E-06	3,67E-05	5,80E-06	0,00E+00	0,00E+00	0,00E+00	1,76E-05	-3,03E-04	-2,06E-05	0,00E+00
EP-terrestrial	mole N eq	8,55E-06	3,30E-05	8,44E-06	3,30E-05	2,74E-04	1,25E-04	0,00E+00	0,00E+00	0,00E+00	1,92E-04	-2,74E-03	-2,34E-04	0,00E+00
POCP	kg NMVOC eq	2,56E-06	6,32E-06	1,61E-06	6,32E-06	9,58E-05	1,72E-05	0,00E+00	0,00E+00	0,00E+00	5,49E-05	-1,21E-03	-5,28E-05	0,00E+00
ADP-minerals & metals[4]	kg Sb eq	6,68E-11	2,13E-10	5,49E-11	2,13E-10	8,86E-08	1,94E-10	0,00E+00	0,00E+00	0,00E+00	8,29E-10	-4,21E-06	-4,73E-09	0,00E+00
ADP-fossil[2]	MJ	2,42E-03	4,12E-02	1,05E-02	4,12E-02	2,31E-01	3,19E-02	0,00E+00	0,00E+00	0,00E+00	1,94E-01	-7,77E+00	-1,64E+00	0,00E+00
WDP[2]	m3	7,41E-06	1,47E-05	3,76E-06	1,47E-05	3,79E-03	2,36E-02	0,00E+00	0,00E+00	0,00E+00	1,39E-03	-5,54E-02	-5,03E-03	0,00E+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													

[4] The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator

Resource use indicators

Results per declared unit: 1 kg														
Indicator	**Unit**	**C1 100%**	**C2 100% RC**	**C2 100% INC**	**C2 100% LF**	**C3 100% RC**	**C3 100% INC**	**C3 100% LD**	**C4 100% RC**	**C4 100% INC**	**C4 100% LF**	**D 100% RC**	**D 100% INC**	**D 100% LF**
PERE	MJ	1,54E-05	3,10E-03	7,93E-04	3,10E-03	1,59E-02	9,01E-03	0,00E+00	0,00E+00	0,00E+00	3,15E-02	6,27E-02	-7,30E-01	0,00E+00
PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	1,54E-05	3,10E-03	7,93E-04	3,10E-03	1,59E-02	9,01E-03	0,00E+00	0,00E+00	0,00E+00	3,15E-02	6,27E-02	-7,30E-01	0,00E+00
PENRE	MJ	2,42E-03	4,12E-02	1,05E-02	4,12E-02	2,31E-01	3,19E-02	0,00E+00	0,00E+00	0,00E+00	1,94E-01	-7,77E+00	-1,64E+00	0,00E+00
PENRM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	2,42E-03	4,12E-02	1,05E-02	4,12E-02	2,31E-01	3,19E-02	0,00E+00	0,00E+00	0,00E+00	1,94E-01	-7,77E+00	-1,64E+00	0,00E+00
SM	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m3	1,72E-07	1,53E-06	3,93E-07	1,53E-06	9,01E-05	5,54E-04	0,00E+00	0,00E+00	0,00E+00	4,09E-05	-7,51E-02	-9,43E-04	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 mandatory and voluntary impact category indicators

Results per declared unit: 1 kg														
Indicator	**Unit**	**C1 100%**	**C2 100% RC**	**C2 100% INC**	**C2 100% LF**	**C3 100% RC**	**C3 100% INC**	**C3 100% LD**	**C4 100% RC**	**C4 100% INC**	**C4 100% LF**	**D 100% RC**	**D 100% INC**	**D 100% LF**
GWP-GHG[5]	kg CO2 eq	1,88E-04	3,26E-03	8,34E-04	3,26E-03	1,97E-02	2,55E-01	0,00E+00	0,00E+00	0,00E+00	1,19E-02	-7,72E-01	-7,20E-02	0,00E+00
Acronyms	**GWP-GHG** = global warming potential - greenhouse gases													

Waste indicators

Results per declared unit: 1 kg														
Indicator	**Unit**	**C1 100%**	**C2 100% RC**	**C2 100% INC**	**C2 100% LF**	**C3 100% RC**	**C3 100% INC**	**C3 100% LD**	**C4 100% RC**	**C4 100% INC**	**C4 100% LF**	**D 100% RC**	**D 100% INC**	**D 100% LF**
HWD	kg	2,17E-06	1,65E-12	4,23E-13	1,65E-12	1,19E-03	6,89E-07	0,00E+00	0,00E+00	0,00E+00	9,63E-07	-6,68E-08	-1,11E-09	0,00E+00
NHWD	kg	1,61E-05	5,75E-06	1,47E-06	5,75E-06	2,95E-02	1,02E-03	0,00E+00	0,00E+00	0,00E+00	5,18E-01	7,93E-02	-1,01E-03	0,00E+00
RWD	kg	0,00E+00	7,77E-08	1,99E-08	7,77E-08	1,16E-06	1,91E-06	0,00E+00	0,00E+00	0,00E+00	2,69E-06	-5,17E-05	-1,88E-04	0,00E+00
Acronyms	**HW** = Hazardous waste disposed; **NHW** = Non-hazardous waste disposed; **RW** = Radioactive waste disposed													

[5] 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 CO2 is set to zero

Output flow indicators

Results per declared unit: 1 kg														
Indicator	**Unit**	**C1 100%**	**C2 100% RC**	**C2 100% INC**	**C2 100% LF**	**C3 100% RC**	**C3 100% INC**	**C3 100% LD**	**C4 100% RC**	**C4 100% INC**	**C4 100% LF**	**D 100% RC**	**D 100% INC**	**D 100% LF**
CRU	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,18E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,44E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EET	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,69E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Acronyms	**CRU** = Components for reuse; **MFR** = Materials for recycling; **MER** = Materials for energy recovery; **EEE** = Exported electric energy; **ETE** = Exported thermal energy													

Disclaimers

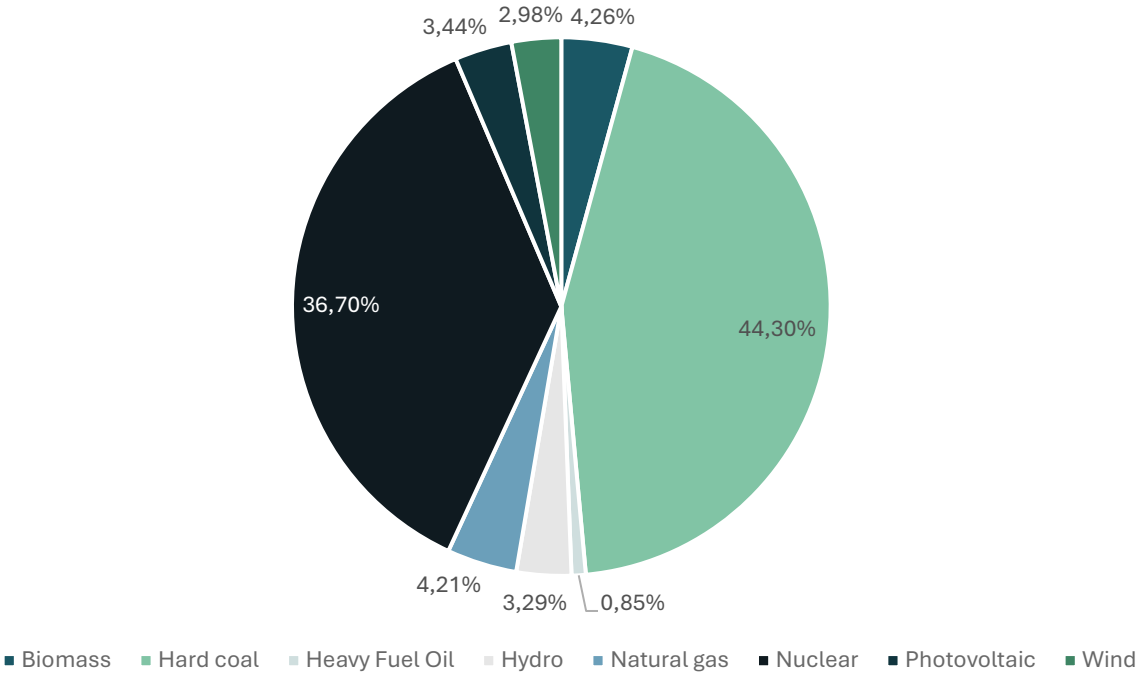
ILCD classification	Indicator	Disclaimer
ILCD Type 1	Global warming potential (GWP)	None
	Depletion potential of the stratospheric ozone layer (ODP)	None
	Potential incidence of disease due to PM emissions (PM)	None
ILCD Type 2	Acidification potential, Accumulated Exceedance (AP)	None
	Eutrophication potential, Fraction of nutrients reaching freshwater end compartment (EP-freshwater)	None
	Eutrophication potential, Fraction of nutrients reaching marine end compartment (EP-marine)	None
	Eutrophication potential, Accumulated Exceedance (EP-terrestrial)	None
	Formation potential of tropospheric ozone (POCP)	None
	Potential Human exposure efficiency relative to U235 (IRP)	1
ILCD Type 3	Abiotic depletion potential for non-fossil resources (ADP-minerals&metals)	2
	Abiotic depletion potential for fossil resources (ADP-fossil)	2
	Water (user) deprivation potential, deprivation-weighted	2
	Water consumption (WDP)	2
	Potential Comparative Toxic Unit for ecosystems (ETP-fw)	2
	Potential Comparative Toxic Unit for humans (HTP-c)	2
	Potential Comparative Toxic Unit for humans (HTP-nc)	2
	Potential Soil quality index (SQP)	2
Disclaimer 1 – This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.		
Disclaimer 2 – The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.		

Additional information

Electricity grid mix

Greenhouse gas emission from the use of electricity in the manufacturing phase.

Residual mix	Unit	Value
Location		Bulgaria
Electricity mix		Biomass: 4,26% Hard coal: 44,30% Heavy Fuel Oil: 0,85% Hydro: 3,29% Natural gas: 4,21% Nuclear: 36,70% Photovoltaic: 3,44% Wind: 2,98%
Reference year		2023
Source		International Energy Agency
GWP excl. Biogenic	kg CO_2-eq. /kWh	0,493



Variation across product range

As this is an EPD with multiple products, there is a variation across the product range. The variation in the products has been based on the shortest and longest connection hose included in this study (worst-case and best-case product). The table below shows the variation between these two products, and the rest of the products included in this EPD lie within this variation.

Impact category	Unit	A1-A3 representative	A1-A3 4000 mm	A1-A3 representative per kg	A1-A3 4000 mm per kg
GWP-GHG	kg CO2 eq	1,76E+00	25%	3,35E+00	4%
GWP-total	kg CO2 eq	1,59E+00	38%	3,11E+00	5%
ODP	kg CFC11 eq	1,00E-08	22%	3,72E-08	2%
AP	mol H+ eq	4,91E-02	40%	9,48E-02	12%
EP-freshwater	kg P eq	3,82E-03	41%	7,38E-03	13%
EP-marine	kg N eq	3,84E-03	34%	7,43E-03	6%
EP-terrestrial	mol N eq	4,76E-02	36%	9,19E-02	8%
POCP	kg NMVOC eq	1,35E-02	36%	2,79E-02	7%
ADPE	kg Sb eq	6,12E-04	43%	1,18E-03	14%
ADPF	MJ	2,82E+01	17%	5,37E+01	12%
WDP	m3 depriv.	9,56E-01	37%	1,82E+00	8%

Abbreviations

Abbreviation	Definition
General Abbreviations	
EN	European Norm (Standard)
EF	Environmental Footprint
GPI	General Programme Instructions
ISO	International Organization for Standardization
CEN	European Committee for Standardization
CPC	Central product classification
SVHC	Substances of Very High Concern
ND	Not Declared
GLO	Global
BG	Bulgaria
NORD	Nordics

References

Dahl NO	Brødrene Dahl https://www.dahl.no/
Dahl SE	Dahl https://www.dahl.se/
Ecoinvent (2025)	Ecoinvent dataset version 3.11 (2025)
EN15804:2012+A2:AC/2021	Sustainability of construction works – Environmental product declaration – Core rules for the product category of constructions products
EPD International (2024)	General Programme Instructions of the International EPD® System, version 5.0
ISO 14020:2022	International Standard ISO 14020 – Environmental statements and programmes for products – Principles and general requirements
ISO 14025:2006	International Standard ISO 14025 – Environmental labels and declarations — Type III environmental declarations — Principles and procedures
ISO 14040:2006	International Standard ISO 14040: Environmental Management – Life cycle assessment – Principles and framework. Second edition 2006-07-01.
ISO 14044:2006	International Standard ISO 14044: Environmental Management – Life cycle assessment – Requirements and Guidelines
International Energy Agency	IEA (2023) Bulgaria energy mix
PCR 2019:14	Construction products v 2.0.1
SCB (2020)	Treated waste by treatment category and waste category. Every second year 2010-2020. https://www.statistikdatabasen.scb.se/pxweb/sv/ssd/START__MI__MI0305/MI0305T003/
Sphera (2025)	Sphera (2025) LCA for Experts. MLC database CUP 2024.02.

Version history

Original Version of the EPD, 2025-11-10

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