

ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

Strabusil LP
FRÄNKISCHE Rohrwerke Gebr. Kirchner GmbH & Co. KG



EPD HUB, HUB-8148
Published on 17.11.2026, last updated on 17.11.2026, valid until 16.11.2031

Life Cycle Assessment study has been performed in accordance with the requirements of EN 15804, EPD Hub PCR version 1.2 (24 Mar 2025) and JRC characterization factors EF 3.1.

Created with One Click LCA

FRÄNKISCHE

GENERAL INFORMATION

MANUFACTURER

Manufacturer	FRÄNKISCHE Rohrwerke Gebr. Kirchner GmbH & Co. KG
Address	Hellinger Str. 1, 97486, Königsberg in Bayern, DE
Contact details	info@fraenkische.de
Website	www.fraenkische.de

EPD STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
Reference standard	EN 15804:2012+A2:2019/AC:2021 and ISO
PCR	EPD Hub Core PCR Version 1.2, 24 Mar 2025
c-PCR	-
Sector	Construction product
Category of EPD	Third party verified EPD
Parent EPD number	-
Scope of the EPD	Cradle to gate with options, A4-A5, and modules C1-C4, D
EPD author	Darja Meier and Lukas Reß, FRÄNKISCHE Rohrwerke Gebr. Kirchner GmbH & Co. KG
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☑ External verification
EPD verifier	Agnieszka Pikus as an authorized verifier for EPD Hub

This EPD is intended for business-to-business communication. The manufacturer has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programs may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

PRODUCT

Product name	Strabusil LP
Additional labels	-
Product reference	55110150
Place(s) of raw material origin	EU
Place of production	Königsberg in Bayern, Germany
Place(s) of installation and use	EU
Place(s) of end-of-life	Europe
Period for data	01.05.2025 - 30.04.2026
Averaging in EPD	Multiple products
Variation in GWP-fossil for A1-A3 (%)	−31
GTIN (Global Trade Item Number)	-
NOBB (Norwegian Building Product Database)	-
A1-A3 Specific data (%)	59,6

ENVIRONMENTAL DATA SUMMARY

Declared unit	one m of pipe
Declared unit mass	1,02548 kg
Mass of packaging	0,097463 kg
GWP-fossil, A1-A3 ($kgCO_2e$)	0,6
GWP-total, A1-A3 ($kgCO_2e$)	0,42
Secondary material, inputs (%)	74,4
Total energy use, A1-A3 (kWh)	-6,16
Net freshwater use, A1-A3 (m^3)	0

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

FRÄNKISCHE Rohrwerke Gebr. Kirchner GmbH & Co. KG, a wholly-owned subsidiary of FRÄNKISCHE Group SE, is among the world's leading suppliers of pipe systems. The family-owned enterprise, founded in 1906 and headquartered in Königsberg, Germany, specialises in developing and producing high-quality pipes, accessories, and system components for electrical installation and drainage, plumbing and heating installation, heat recovery ventilation, and stormwater management. Three key historical inventions form the basis for the company's success and its diverse product and solution portfolio: the world's first flexible corrugated metal conduit, which revolutionised electrical installation (1952), the world's first continuously extruded flexible plastic electrical conduit (1959), and the world's first corrugated and continuously produced plastic drainage pipe (1961). FRÄNKISCHE Rohrwerke currently employs around 1,400 people and operates production sites and sales facilities in Germany, as well as branches across Europe. For more information, please refer to www.fraenkische.com.

PRODUCT DESCRIPTION

Strabusil® is a pipe system for the drainage of roads, airfields, sports facilities, and other areas with elevated requirements for drainage pipes. The pipes feature a composite construction with a corrugated outer wall and a smooth inner surface.
The product system comprises:
Strabusil® LP – partial-perforation drainage pipe
Nominal sizes: DN/ID 100, 150, 200, 250, 300, 350, 400, 500, 600
Strabusil® TP – full-perforation drainage pipe
Nominal sizes: DN/ID 100, 150, 200, 250, 300, 350, 400, 500, 600
Strabusil® MP – multipurpose pipe
Nominal sizes: DN/ID 200, 250, 300, 350, 400, 500, 600
Strabusil® UP – non-perforated pipe
Nominal sizes: DN/ID 100, 150, 200, 250, 300, 350, 400, 500, 600

Strabusil® LP and TP are used for reliable drainage: LP with defined slot fields (partial-perforation), TP with circumferential perforation (full-perforation); both absorb unbound ground water and discharge it to the receiving water. Strabusil® MP combines the partial-drainage function with a collector function over longer distances and can also take up surface water if required. Strabusil® UP is non-perforated and is used purely as a collection and discharge pipe where no water intake from the surrounding soil is required.
The partial-, full-perforation and multipurpose pipes comply with DIN 4262-1, type R2. They provide a water inlet area of at least 50 cm²/m and a slot width of 1.2 mm ± 0.4 mm. The pipes have a ring stiffness of class SN 4 according to DIN EN ISO 9969 and are suitable for use in accordance with the guidelines for road drainage.
All pipe variants have the same material composition, are available in black, and have identical dimensions within a given nominal diameter. For the Strabusil® LP and Strabusil® MP variants, a white crown marking also aids in proper alignment and facilitates installation. The differences between the variants result solely from the perforation and the resulting functionality.
The EPD covers Strabusil® LP, TP, MP and UP. For the life cycle assessment, Strabusil® LP in DN/ID 150 is used as the reference product, as this variant has the highest sales share.
Strabusil® is used as a drainage and dewatering pipe for collecting and conveying water. The intended applications include, in particular, the drainage of roads, airfields and sports facilities, as well as other applications with elevated requirements for drainage pipes. The selection of the respective pipe variant and nominal size is made in accordance with project-specific requirements and the applicable technical regulations.

Further information can be found at: www.fraenkische.de

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals		
Minerals	17	France
Fossil materials	83	Europe
Bio-based materials		

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	0
Biogenic carbon content in packaging, kg C	0,0469

1 kg of biogenic carbon is equivalent to 44/12 kg of CO_2

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	one m of pipe
Mass per declared unit	1,02548 kg
Functional unit	-
Reference service life	-

SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0,1 % (1000 ppm).

PRODUCT LIFE-CYCLE

SYSTEM BOUNDARY

This EPD covers the life-cycle modules listed in the following table.

Product stage			Assembly stage		Use stage							End of life stage				Beyond the system boundaries		
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D		
x	x	x	x	x	ND	ND	ND	ND	ND	ND	ND	x	x	x	x	x		
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction/ demolition	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling

Not declared = ND

MANUFACTURING AND PACKAGING (A1-A3)

The environmental impacts considered for the product stage cover the manufacturing of raw materials used in the production as well as packaging materials and other ancillary materials. Also, fuels used by machines, and handling of waste formed in the production processes at the manufacturing facilities are included in this stage. The study also considers the material losses occurring during the manufacturing processes as well as losses during electricity transmission.

A market-based approach is used in modelling the electricity mix utilized in the factory.
The product consists of virgin HDPE, recycled polyethylene (PE recyclate) and mineral fillers. The total recycled content (post-consumer) is approximately 74 percent. The sorted post-consumer PE-HD waste are from Germany and Poland. After the material arrives at the production plant in Königsberg, the PCR material undergoes a standardized internal purity and quality inspection to ensure compliance with specifications for further processing. For the recycled polyethylene, the data set “Market for waste polyethylene, for recycling, sorted (Reference product: waste polyethylene, for recycling, sorted)” for the global market from the Ecoinvent 3.12 database is used. The weighted average distances for transporting the main raw materials are as follows: virgin HDPE travels an average of 289 km, mineral filler 359 km, and recycled HDPE 356 km. Raw materials are delivered to the production plant entirely via road freight transport (trucks). All transport distances were specifically recorded in the life cycle assessment model based on the actual supplier locations. The electrical energy for both process steps (pelletization of the post-consumer recycled (PCR) fraction and pipe extrusion) is covered by the country-specific residual mix. For this purpose, the data set “Electricity, Medium Voltage, Residual Mix (Reference Product: Electricity, Medium Voltage)” for Germany from the Ecoinvent v3.10.1 database is used in the life cycle assessment. The manufacture of Strabusil® pipes comprises the following process steps: plasticizing the plastic components (PE-HD), including additives, in extruders; continuous forming of the corrugated outer wall and smooth inner surface in corrugators using specially manufactured forming tools; subsequent cooling of the corrugated plastic pipes; cutting to 6 m lengths as well as handling and packaging. During manufacturing, Various auxiliary materials are used during production. The exact amount required is 0.0097 m^3 of compressed air and 0.600557404 kg of water. Additional there is a production loss of approximately 1,7% occurs; however, this material is not discarded but is fully returned to subsequent production cycles, ensuring

resource efficiency and avoiding external waste. As a result, no relevant waste is generated during manufacturing (Module A3), and no transport of A3 waste is required.
Environment and health during manufacturing
Given the manufacturing conditions, no measures for environmental protection or occupational health are required beyond the applicable EU regulations and the national legal and other requirements. Strabusil® pipes are supplied in straight 6 meter lengths. The pipes are bundled in transport-stable packs (wooden frames with plastic strapping). This amounts to exactly 0.0971 kg of wood and 0.0003625 kg of plastic per meter. The pipes are delivered directly to the construction site by truck. Packaging fractions and their end of life treatment follow the disposal routes customary at the place of installation.

TRANSPORT AND INSTALLATION (A4-A5)

Transportation impacts occurred from final products delivery to construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions. Strabusil® pipes are manufactured, packaged and delivered as 6 m pipe lengths.
Transport-related impacts arising from the delivery of the end products to the construction site include direct exhaust emissions from fuel combustion, environmental impacts associated with fuel production, and emissions associated with the relevant transport infrastructure. The average transport distance is 346 kilometers from the production plant to the installation site is based on the company's actual sales-weighted averages in its local markets. Transport is by truck as 6 m pipe lengths; smaller nominal sizes (DN/ID 100–200) are dispatched from Königsberg, larger nominal sizes (DN/ID 250–600) from Schwarzheide. An average volumetric load factor of 90% is assumed. Empty return trips are not considered separately, as the haulage vehicles typically proceed to subsequent transport assignments after delivery. Due to proper packaging, no product losses are assumed during transport.

Environmental impacts arising from installation include the disposal of packaging waste. Installation is predominantly manual; depending on nominal size, pipe weight and site conditions, suitable lifting and construction machinery (e.g. excavator) are used for handling and positioning. The pipe sections are primarily connected using couplings or T-fittings. The volume of excavation required depends on the nominal diameter, the installation depth, the trench width, and local conditions. The trench excavation for the Strabusil pipe is part of the overall construction work and is therefore outside the scope of installation.

PRODUCT USE AND MAINTENANCE (B1-B7)

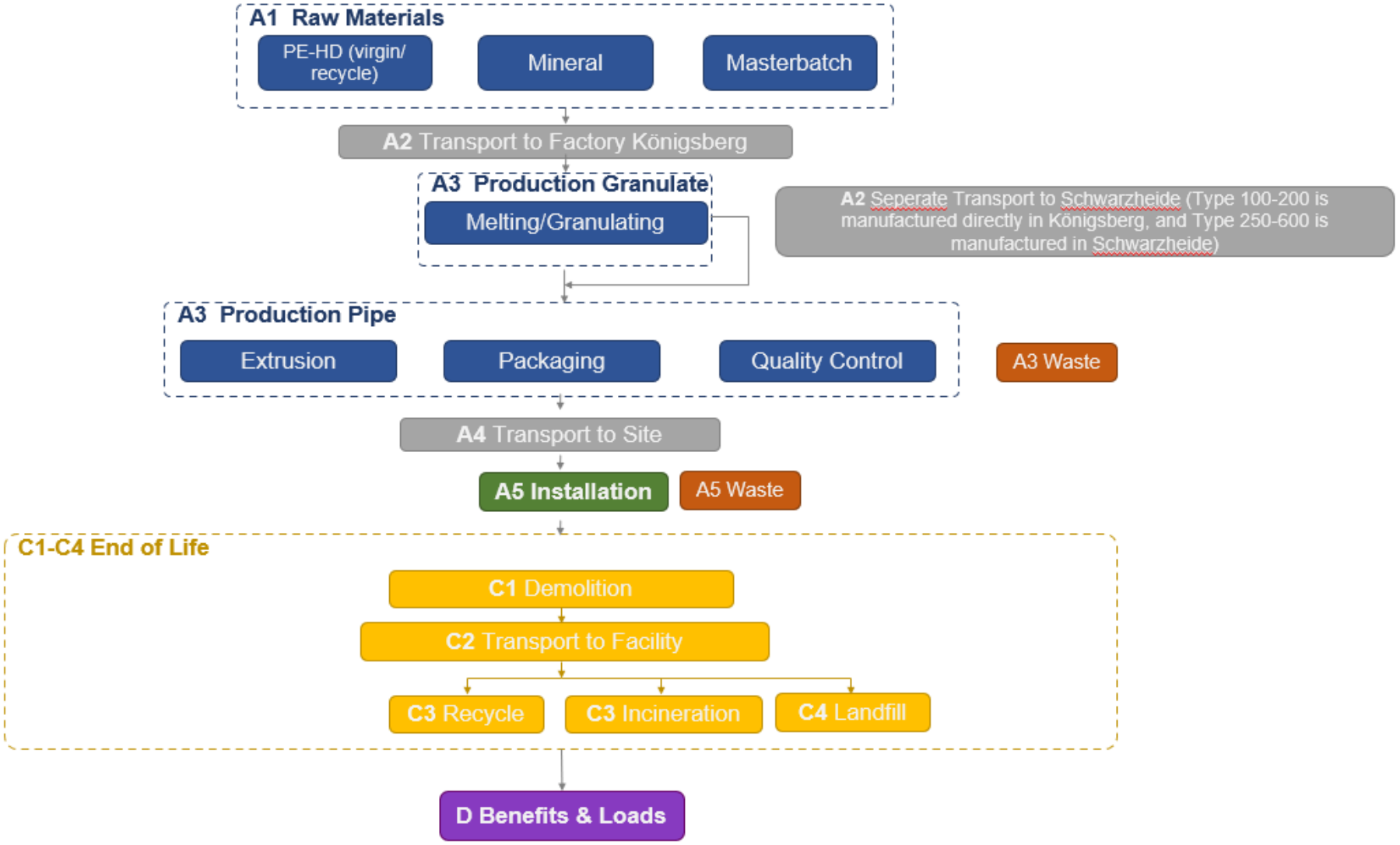
This stage is not included in the scope.

PRODUCT END OF LIFE (C1-C4, D)

It is assumed that during dismantling, an excavator will be used solely to remove the soil cover on and around the pipes. Collection and loading are done manually or for larger pipe diameters with an excavator. Fuel consumption of machinery for loading is excluded based on cut-off criteria (see Cut-off criteria section. The earthwork is part of the construction process and therefore falls outside the scope of the product system. It is assumed that the end-of-life product is transported by truck to the nearest waste treatment facility, the distance to which is estimated at 50 km (C2). Given the Europe-wide distribution of our customer base, the European average (according to Eurostat) is used for the end-of-life scenario. Despite the presence of mineral content, the end-of-life treatment of polyethylene is defined as an appropriate and representative approximation for the product as a whole. The end-of-life product is disposed of in Europe, and the respective end-of-life scenarios are modeled according to EUROSTAT

(source:
https://ec.europa.eu/eurostat/databrowser/view/env_waspac__custom_8519242/default/table?lang=en).
100% of the end-of-life product is collected separately from the demolition site, with 40% sent for recycling and 37% for incineration (C3). 23% of the end-of-life product ends up in landfills (C4). Module D is calculated using a system expansion approach in line with EN 15804+A2, ch. 6.3.5.6. The system boundary begins where recovered material or energy leaves the product system as a marketable secondary output (beyond the end-of-waste point), and only the net benefit relative to the avoided primary process is credited.
Substituted processes and reference year:
Recycled PE: 1 kg of recycled HDPE granulate is assumed to displace 1 kg of virgin HDPE granulate production, on a 1:1 mass basis with no additional quality-correction factor applied. Reference dataset: ecoinvent v3.11 (released December 2024).
Incineration energy recovery: displaces EU-average grid electricity (medium voltage) and district/industrial heat (non-natural-gas), same database and reference year.
A5 wood packaging: the recycled fraction is modeled as secondary wood chips (post-consumer wood, dry mass) rather than displacing virgin timber directly; the incinerated fraction displaces the same EU-average electricity/heat mix. The biogenic CO2 released from combusting the wood fraction is accounted for separately and excluded from the fossil-CO2 result.

LIFE CYCLE FLOW DIAGRAM



LIFE-CYCLE ASSESSMENT

CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the reference standard and the applied PCR. The study does not exclude any hazardous materials or substances. The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes, for which data is available for, are included in the calculation. There is no neglected unit process more than 1% of total mass or energy flows. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

The production of capital equipment, construction activities, and infrastructure, maintenance and operation of capital equipment, personnel-related activities, energy and water use related to company management and sales activities are excluded.

There is a production waste of 1,7 % which is recycled into the production process of the pipe.
Earthwork performed during installation and removal is part of the construction process and therefore falls outside the scope of the product system.
Coupling sockets are used to connect the Strabusil® pipe lengths. The required quantity depends on the delivered pipe length and the specific installation situation.The coupling sockets are separate products and not included.
Fuel consumption of machinery (e.g. excavator) used for lifting and positioning pipes during installation (A5) and for loading pipes during deconstruction (C1) is excluded from the system boundary. The fuel consumption for these short handling operations is negligible and accounts for significantly less than 1% of total environmental impacts.

VALIDATION OF DATA

Data collection for production, transport, and packaging was conducted using time and site-specific information, as defined in the general information section on page 1 and 2. Upstream process calculations rely on generic data as defined in the Bibliography section. Manufacturer-provided specific and generic data were used for the product's manufacturing stage. The analysis was performed in One Click LCA EPD Generator, with the 'Cut-Off, EN 15804+A2' allocation method, and characterization factors according to EN 15804:2012+A2:2019/AC:2021 and JRC EF 3.1.

ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation. All allocations are done as per the reference standards and the applied PCR. In this study, allocation has been done in the following ways:

Data type	Allocation
Raw materials	No allocation
Packaging material	No allocation
Ancillary materials	No allocation
Manufacturing energy and waste	Physical Properties

PRODUCT & MANUFACTURING SITES GROUPING

Type of grouping	Multiple products
Grouping method	Based on a representative product
Variation in GWP-fossil for A1-A3, %	−31

The declared representative product (Strabusil LP DN/ID 150) has a GWP-fossil of 0.58 kg CO2e/kg in modules A1–A3, representing the highest impact per kg among the product group. Across all dimensions (DN/ID 100 to 600), the GWP-fossil ranges from 0.40 to 0.58 kg CO2e/kg, resulting in a maximum variation of -31.3% relative to the declared product. The specific GWP-fossil values for all dimensions are provided in the Annex.

LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator for EPD Hub V3 and EPD Process Certification v3.2.5. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. The EPD Generator uses Ecoinvent v3.10.1/3.11/3.12 and One Click LCA databases as sources of environmental data. Allocation used in Ecoinvent 3.10.1/3.11/3.12 environmental data sources follow the methodology ‘allocation, Cut-off, EN 15804+A2‘.

https://www.bmv.de/SharedDocs/DE/Artikel/G/amtliche-gueterkraftverkehrsstatistik.html -> nearly all trucks have the Euro 6 emission sticker
EUROSTAT
Packaging waste by waste management operations (EU-27 average, data year 2021/2022) -> Source of the packaging waste treatment shares in module A5 (wood: 32/30/38%; plastic: 40/37/23%) and the product waste treatment shares in modules C3/C4. Link: https://ec.europa.eu/eurostat/databrowser/view/env_waspac__custom_8519242/default/table?lang=en
Ecoinvent database: Version 3.10 (published 2023) and Version 3.11 (published 2024) for background LCI waste treatment processes.

ENVIRONMENTAL IMPACT DATA

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

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total[1)]	kg CO_2e	2,28E-01	4,65E-02	1,48E-01	4,23E-01	4,13E-02	1,81E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,52E-03	1,21E+00	2,80E-02	-1,31E+00
GWP – fossil	kg CO_2e	2,27E-01	4,65E-02	3,25E-01	5,99E-01	4,13E-02	3,75E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,52E-03	1,21E+00	2,80E-02	-1,27E+00
GWP – biogenic	kg CO_2e	8,75E-04	1,00E-05	-1,77E-01	-1,76E-01	8,71E-06	1,77E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-3,93E-02
GWP – LULUC	kg CO_2e	1,19E-04	1,83E-05	2,24E-04	3,61E-04	1,50E-05	5,09E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,47E-06	4,41E-05	1,55E-06	-8,90E-04
Ozone depletion pot.	kg $CFC\text{-}_{11}$e	1,12E-08	9,38E-10	3,03E-09	1,52E-08	9,72E-10	5,34E-11	ND	ND	ND	ND	ND	ND	ND	0,00E+00	8,15E-11	3,05E-10	6,49E-11	-5,09E-08
Acidification potential	mol H^+e	6,57E-04	1,09E-04	8,47E-04	1,61E-03	9,72E-05	1,85E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,88E-05	2,81E-04	1,80E-05	-4,98E-03
EP-freshwater[2)]	kg Pe	3,90E-05	4,02E-06	1,29E-04	1,72E-04	3,05E-06	9,35E-07	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,30E-07	9,92E-06	2,65E-07	-4,12E-04
EP-marine	kg Ne	1,43E-04	2,87E-05	2,35E-04	4,06E-04	2,70E-05	1,93E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,18E-06	1,63E-04	6,09E-05	-8,44E-04
EP-terrestrial	mol Ne	1,47E-03	3,08E-04	2,25E-03	4,03E-03	2,91E-04	7,52E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,73E-05	1,21E-03	7,48E-05	-8,64E-03
POCP ("smog")[3)]	kg NMVOCe	1,25E-03	1,77E-04	7,36E-04	2,16E-03	1,72E-04	2,48E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,77E-05	3,27E-04	3,29E-05	-6,00E-03
ADP-minerals & metals[4)]	kg Sbe	1,23E-06	1,49E-07	3,03E-07	1,68E-06	1,24E-07	9,08E-09	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,54E-08	2,74E-07	4,88E-09	-4,60E-06
ADP-fossil resources	MJ	7,43E+00	6,77E-01	4,33E+00	1,24E+01	6,23E-01	4,74E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	8,01E-02	3,16E-01	5,73E-02	-3,67E+01
Water use[5)]	m^3e depr.	6,21E-02	3,76E-03	3,34E-02	9,92E-02	3,59E-03	1,67E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,96E-04	3,46E-02	2,52E-03	-3,74E-01

1) GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter	Incidence	4,66E-09	4,08E-09	9,30E-09	1,80E-08	4,09E-09	3,28E-10	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,53E-10	1,46E-08	4,15E-10	-2,54E-08
Ionizing radiation[6)]	kBq U235e	1,79E-02	6,65E-04	3,11E-02	4,97E-02	6,70E-04	1,22E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,98E-05	9,83E-04	4,65E-05	-2,19E-01
Ecotoxicity (freshwater)	CTUe	4,78E+00	1,14E-01	6,39E-01	5,54E+00	8,38E-02	5,57E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,13E-02	6,96E+00	1,60E-01	-8,66E+00
Human toxicity, cancer	CTUh	4,19E-11	7,41E-12	5,44E-11	1,04E-10	6,59E-12	1,61E-12	ND	ND	ND	ND	ND	ND	ND	0,00E+00	9,11E-13	1,38E-10	8,87E-13	-1,44E-10
Human tox. non-cancer	CTUh	1,38E-09	4,17E-10	3,25E-09	5,05E-09	3,86E-10	8,67E-11	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,19E-11	2,48E-09	1,48E-10	-6,99E-09
SQP[7)]	-	5,14E-01	5,68E-01	1,81E+01	1,92E+01	6,29E-01	4,42E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	8,07E-02	4,26E-01	1,36E-01	-3,71E+00

6) EN 15804+A2 disclaimer for Ionizing radiation, human health. 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; 7) SQP = Land use related impacts/soil quality.

USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy[8)]	MJ	1,73E-01	1,02E-02	1,78E+00	1,97E+00	9,67E-03	-1,43E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,10E-03	2,58E-02	7,66E-04	-1,72E+00
Renew. PER as material	MJ	0,00E+00	0,00E+00	1,67E+00	1,67E+00	0,00E+00	-1,67E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,91E-01
Total use of renew. PER	MJ	1,73E-01	1,02E-02	3,46E+00	3,64E+00	9,67E-03	-3,10E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,10E-03	2,58E-02	7,66E-04	-1,33E+00
Non-re. PER as energy	MJ	-2,92E+01	6,77E-01	4,32E+00	-2,42E+01	6,23E-01	3,28E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	8,01E-02	-3,20E+01	-9,18E+00	-3,67E+01
Non-re. PER as material	MJ	3,66E+01	0,00E+00	9,79E-03	3,66E+01	0,00E+00	-9,79E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	-2,67E+01	-9,88E+00	1,75E+01
Total use of non-re. PER	MJ	7,43E+00	6,77E-01	4,33E+00	1,24E+01	6,23E-01	2,30E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	8,01E-02	-5,87E+01	-1,91E+01	-1,93E+01
Secondary materials	kg	7,63E-01	2,94E-04	8,13E-04	7,64E-01	2,64E-04	3,17E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,41E-05	1,45E-03	1,97E-05	4,31E-01
Renew. secondary fuels	MJ	5,61E-06	3,86E-06	1,54E-05	2,49E-05	3,49E-06	3,33E-07	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,33E-07	1,18E-05	3,96E-07	-1,43E-05
Non-ren. secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m^3	1,44E-03	8,92E-05	3,11E-03	4,64E-03	8,23E-05	-1,24E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,18E-05	3,34E-04	-8,73E-04	-8,68E-03

8) PER = Primary energy resources.

END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	6,73E-03	4,17E-03	3,61E-02	4,70E-02	3,51E-03	3,10E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,36E-04	1,34E-02	9,45E-05	-4,60E-02
Non-hazardous waste	kg	2,14E+00	7,17E-02	1,27E+00	3,48E+00	7,31E-02	1,31E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,51E-03	4,95E-01	6,23E-01	-9,90E+00
Radioactive waste	kg	4,55E-06	1,60E-07	9,30E-06	1,40E-05	1,62E-07	3,03E-08	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,71E-08	2,46E-07	1,14E-08	-5,60E-05

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,12E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	4,10E-01	0,00E+00	0,00E+00
Materials for energy rec	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	3,79E-01	0,00E+00	0,00E+00
Exported energy	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,57E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	6,12E+00	0,00E+00	0,00E+00
Exported energy – Electricity	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,60E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	2,57E+00	0,00E+00	0,00E+00
Exported energy – Heat	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,06E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	3,55E+00	0,00E+00	0,00E+00

ENVIRONMENTAL IMPACTS – EN 15804+A1, CML

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Pot.	kg CO_2e	2,25E-01	4,62E-02	3,23E-01	5,94E-01	4,10E-02	5,85E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,49E-03	1,22E+00	2,68E-02	-1,24E+00
Ozone depletion Pot.	kg $CFC_{-11}e$	9,16E-09	7,46E-10	2,45E-09	1,24E-08	7,72E-10	4,31E-11	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,50E-11	2,59E-10	5,22E-11	-4,16E-08
Acidification	kg SO_2e	5,38E-04	8,66E-05	6,74E-04	1,30E-03	7,64E-05	1,37E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,44E-05	2,05E-04	1,33E-05	-4,18E-03
Eutrophication	kg PO_4^3e	3,76E-04	2,37E-05	1,43E-04	5,43E-04	2,06E-05	4,81E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,50E-06	6,96E-05	8,26E-06	-1,69E-03
POCP (“smog”)	kg C_2H_4e	8,70E-05	8,58E-06	5,53E-05	1,51E-04	7,80E-06	1,55E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,28E-06	2,53E-05	5,18E-06	-4,54E-04
ADP-elements	kg Sbe	1,20E-06	1,46E-07	3,00E-07	1,65E-06	1,21E-07	8,71E-09	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,50E-08	2,65E-07	4,72E-09	-4,49E-06

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
ADP-fossil	MJ	7,12E+00	6,66E-01	3,72E+00	1,15E+01	6,12E-01	4,54E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	7,90E-02	3,00E-01	5,65E-02	-3,28E+01

ENVIRONMENTAL IMPACTS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Radioactive waste, high	kg	1,05E-06	4,25E-08	1,93E-06	3,02E-06	4,14E-08	8,04E-09	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,01E-09	7,52E-08	3,26E-09	-1,23E-05
Radioactive waste, int/low	kg	3,50E-06	1,18E-07	7,37E-06	1,10E-05	1,20E-07	2,23E-08	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,21E-08	1,71E-07	8,12E-09	-4,37E-05

ADDITIONAL INDICATOR – GWP-GHG

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG[9)]	kg CO_2e	2,28E-01	4,65E-02	3,25E-01	5,99E-01	4,13E-02	3,76E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,52E-03	1,21E+00	2,80E-02	-1,28E+00

9) This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. In addition, the characterisation factors for the flows – CH4 fossil, CH4 biogenic and Dinitrogen monoxide – were updated. This indicator is identical to the GWP-total of EN 15804:2012+A2:2019 except that the characterisation factor for biogenic CO2 is set to zero

SCENARIO DOCUMENTATION

DATA SOURCES

Manufacturing energy scenario documentation

1. Electricity, medium voltage, residual mix, Germany, Ecoinvent, 0.80 kgCO2e/kWh
2. Electricity, medium voltage, residual mix, Germany, Ecoinvent, 0.80 kgCO2e/kWh

Transport scenario documentation - A4 (Transport resources)

1. Market for transport, freight, lorry, >32 metric ton, diesel, EURO 6, 346.0 km

Transport to the building site (A4) - Scenario documentation

Scenario parameter	Value
Capacity utilization (including empty return) %	90
Bulk density of transported products	36,8
Volume capacity utilization factor	<1

Installation at the building site (A5) - Scenario documentation

Scenario parameter	Value
Energy: type and consumption (MJ or kWh)	0 KwH. (The trench excavation for the Strabusil pipe is part of the overall construction work and is therefore outside the scope of installation.)
Water use (m^3)	-
Ancillary materials: type and mass (kg)	0 kg (coupling sockets are separate products and not included)
Waste materials: type and mass (kg)	packaging materials: 0,0971 kg of wooden pallet and 0,0003625 kg of plastic string. Usable pipe offcuts and trimmings arising during installation are generally not disposed of but taken to the next construction site and reused there. Therefore, no relevant product losses are assumed for installation. The waste generated in Module A5 thus consists essentially of the packaging materials of the pipe lengths. Product-related waste does not occur, or only to a negligible extent, under the underlying assumptions

Waste materials: output routes	The installation waste is treated according to typical European scenarios. Minor residual materials and packaging are managed through recycling, incineration, or landfill according to standard practices: - Plastic: 40 % recycling, 37 % incineration, 23 % landfill - Wood: 32 % recycling, 30 % incineration, 38 % landfill The treatment shares for plastic and wood packaging are based on European average data from Eurostat. Background processes are modeled using Ecoinvent 3.10 (2023) and 3.11 (2024) For both packaging types and all disposal routes, it is assumed that the respective waste treatment processes take place at a distance of 50 km from the construction site assumption.
Direct emissions (kg)	0 Kg

End of life (C1-C4) - Scenario documentation

Scenario information	Value
Collection process: collected separately (kg)	1,02548 kg collected separately
Collection process: Mixed waste (kg)	-
Recovery: re-use (kg)	0
Recovery: recycling (kg)	0,41
Recovery: energy recovery (kg)	0,38
Disposal (kg)	0,24
Scenario assumptions e.g. transportation (mode, km) & other	The end-of-life product is assumed to be sent to the closest waste treatment facility by lorry and is assumed to be 50 km away (C2)

THIRD-PARTY VERIFICATION STATEMENT

EPD Hub declares that this EPD is verified in accordance with ISO 14025 by an independent, third-party verifier. The project report on the Life Cycle Assessment and the report(s) on features of environmental relevance are filed at EPD Hub. EPD Hub PCR and ECO Platform verification checklist are used.

EPD Hub is not able to identify any unjustified deviations from the PCR and EN 15804+A2 in the Environmental Product Declaration and its project report.

EPD Hub maintains its independence as a third-party body; it was not involved in the execution of the LCA or in the development of the declaration and has no conflicts of interest regarding this verification.

The company-specific data and upstream and downstream data have been examined as regards plausibility and consistency. The publisher is responsible for ensuring the factual integrity and legal compliance of this declaration.

The software used in creation of this LCA and EPD is verified by EPD Hub to conform to the procedural and methodological requirements outlined in ISO 14025:2010, ISO 14040/14044, EN 15804+A2, and EPD Hub Core Product Category Rules and General Program Instructions.

Verified tools

Tool verifier: Magaly Gonzalez Vazquez
Tool verification validity: 27 March 2025 - 26 March 2028

Agnieszka Pikus as an authorized verifier for EPD Hub Limited

17.11.2026



ANNEX:

GWP total for A1-A3 stages per available dimesnion.

Product	DN/ID	SAP-Item Number	Infor-Item Number	Product weight (kg/m)	Global Warming Potential fossil for A1-A3 stages (kg CO2e/m)	Global Warming Potential fossil for A1-A3 stages (kg CO2e/kg)
Strabusil LP	100	1001-4069-00	55110100	0,5504	3,19E-01	0,579578488
	150	1001-4070-00	55110150	1,0255	5,99E-01	0,584105314
	200	1001-4071-00	55110200	1,9507	7,83E-01	0,401394371
	250	1001-4072-00	55110250	2,8007	1,42E+00	0,507016103
	300	1001-4073-00	55110300	3,6007	1,92E+00	0,53322965
	350	1001-4074-00	55110350	5,2008	2,61E+00	0,50184587
	400	1001-4075-00	55110400	6,3015	3,36E+00	0,533206379
	500	1001-4076-00	55110500	10,7	4,66E+00	0,435514019
	600	1001-4077-00	55110600	15	6,25E+00	0,416666667
Strabusil TP	100	1001-4019-00	55100100	0,5504	3,19E-01	0,579578488
	150	1001-4020-00	55100150	1,0255	5,99E-01	0,584105314
	200	1001-4021-00	55100200	1,9507	7,83E-01	0,401394371
	250	1001-4023-00	55100250	2,8007	1,42E+00	0,507016103
	300	1001-4025-00	55100300	3,6007	1,92E+00	0,53322965
	350	1001-4027-00	55100350	5,2008	2,61E+00	0,50184587
	400	1001-4028-00	55100400	6,3015	3,36E+00	0,533206379
	500	1001-4029-00	55100500	10,7	4,66E+00	0,435514019
	600	1001-4030-00	55100600	15	6,25E+00	0,416666667
Product	**DN/ID**	**SAP-Item Number**	**Infor-Item Number**			

				Product weight (kg/m)	Global Warming Potential fossil for A1-A3 stages (kg CO2e/m)	Global Warming Potential fossil for A1-A3 stages (kg CO2e/kg)
Strabusil MP	200	1001-4121-00	55120200	1,9507	7,83E-01	0,401394371
	250	1001-4122-00	55120250	2,8007	1,42E+00	0,507016103
	300	1001-4123-00	55120300	3,6007	1,92E+00	0,53322965
	350	1001-4124-00	55120350	5,2008	2,61E+00	0,50184587
	400	1001-4125-00	55120400	6,3015	3,36E+00	0,533206379
	500	1001-4126-00	55120500	10,7	4,66E+00	0,435514019
	600	1001-4127-00	55120600	15	6,25E+00	0,416666667
Strabusil UP	100	1002-5593-00	55134100	0,5504	3,19E-01	0,579578488
	150	1002-5592-00	55134150	1,0255	5,99E-01	0,584105314
	200	1002-5594-00	55134200	1,9507	7,83E-01	0,401394371
	250	1002-5588-00	55134250	2,8007	1,42E+00	0,507016103
	300	1002-5589-00	55134300	3,6007	1,92E+00	0,53322965
	350	1002-5595-00	55134350	5,2008	2,61E+00	0,50184587
	400	1002-5596-00	55134400	6,3015	3,36E+00	0,533206379
	500	1002-5591-00	55134500	10,7	4,66E+00	0,435514019
	600	1002-5590-00	55134600	15	6,25E+00	0,416666667