

# Environmental Product Declaration



In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021  
The EPD covers multiple sizes of one product

## Inpipe Liner




Programme:	The International EPD® System, <a href="http://www.environdec.com">www.environdec.com</a>
Programme operator:	EPD International AB
EPD registration number:	S-P-11276
Publication date:	2023-12-04
Valid until:	2028-12-04

*An EPD should provide current information and may be updated if conditions change. The stated validity is, therefore, subject to the continued registration and publication at [www.environdec.com](http://www.environdec.com)*

## General information

### Programme information

<b>Programme:</b>	The International EPD® System
<b>Address:</b>	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
<b>Website:</b>	<a href="http://www.environdec.com">www.environdec.com</a>
<b>E-mail:</b>	<a href="mailto:info@environdec.com">info@environdec.com</a>

<b>Accountabilities for PCR, LCA and independent, third-party verification</b>
<b>Product Category Rules (PCR)</b>
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): <i>Construction products, 2019:14, version 1.2.5, valid until 2024-12-20</i>
Claudia A. Peña conducted a PCR review. <i>The review panel may be contacted via <a href="mailto:info@environdec.com">info@environdec.com</a>.</i>
<b>Life Cycle Assessment (LCA)</b>
<i>Karin Lagercrantz &amp; Marcus Wendin, Miljögiraff, <a href="mailto:marcus@miljogiraff.se">marcus@miljogiraff.se</a></i>
<b>Third-party verification</b>
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:
<input checked="" type="checkbox"/> EPD verification by individual verifier
Third-party verifier: <i>Viktor Hakkarainen, VästLCA,</i> 
Approved by: The International EPD® System
The procedure for follow-up of data during EPD validity involves a third-party verifier:
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

The EPD owner is the sole owner, 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. similar 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: Inpipe Sweden AB

Contact: Nicklas Björnvind

Description of the organisation:

### About Inpipe Sweden AB

Inpipe Sweden AB operates a state-of-the-art production facility in the picturesque heart of Southern Lapland, Vilhelmina, Sweden. Here, we develop and manufacture our entire range of liners, spanning from 150 mm to 1800 mm in diameter.

Our core expertise lies in providing groundbreaking, robust, flexible, and eco-conscious solutions for rehabilitating existing pipelines without excavation—a technique often called "no-dig repair." Our products are meticulously tailored to meet market demands, fostering environmental sustainability while delivering cost-effective solutions for pipe owners.

At Inpipe, we take pride in our comprehensive approach to customer satisfaction. We collaborate closely with our installation partners, offering support throughout the installation journey, from initial planning to on-site assistance, culminating in the successful completion of each project.

With over 35 years of invaluable experience, we stand out as the Nordic region's premier fiberglass-reinforced liners and installation equipment manufacturer. Our reputation extends far beyond our homeland, as our pipes have been installed in numerous global locations, contributing to many prosperous ventures.

Product-related or management system-related certifications: ISO 9001-certified

Name and location of production site:

Inpipe Sweden AB, Ekorrvägen 12, 912 32 Vilhelmina, Sweden

Telephone +46 940-395 30

info@inpipe.se

## Product information

Product name: Inpipe Liner

Product identification: The product comes in several sizes

Product Description: Inpipe standard glass fibre-reinforced polyester liner.

UN CPC code: 36320 v2.1 year 2015

We specialise in manufacturing products for pipeline repairs using trenchless methods, often called "no-dig" or relining techniques.

An Inpipe liner is constructed from multiple layers of corrosion-resistant fibreglass and polyester. This liner is characterised by its soft, flexible nature, making it exceptionally easy to handle when installing sewage pipes, gravity pipes, pressure pipes, and road and railway culverts.

Inpipe Liners are available in diameters ranging from Ø150 mm to Ø1800 mm, with various thicknesses and ring stiffness classes. Our innovative approach involves inserting a pliable liner reinforced with fibreglass and polyester into the existing pipe. This liner is then expanded using compressed air and cured in place with UV light, creating a robust new pipe within the existing one. Our method offers potential cost savings of up to 80% compared to traditional excavation and pipe

replacement methods. An Inpipe liner is designed to have a standard service life of 50 years, with an expected lifespan of 100 years or more.

Adopting sustainable practices is imperative, given the increasing urgency of addressing climate change. Opting for Inpipe liners over conventional excavation methods can significantly reduce carbon dioxide emissions, leading to substantial environmental benefits. This choice translates into significant reductions in overall carbon footprint, demonstrating a firm commitment to shaping a sustainable future through the conscious embrace of eco-friendly solutions like the Inpipe liners.

## **LCA information**

Functional unit / declared unit: 1 kg liner

The calculations are based on a liner with a diameter of 225 mm, SN class 3. Still, they represent all dimensions and SN classes, as the difference in environmental impact is less than 10% in all impact categories. The climate impact per meter liner (for modules A1-A3) is presented in Table 9 under “Additional information”, together with conversion factors to calculate the result per meter liner for other impact categories and indicators.

Reference service life: not applicable

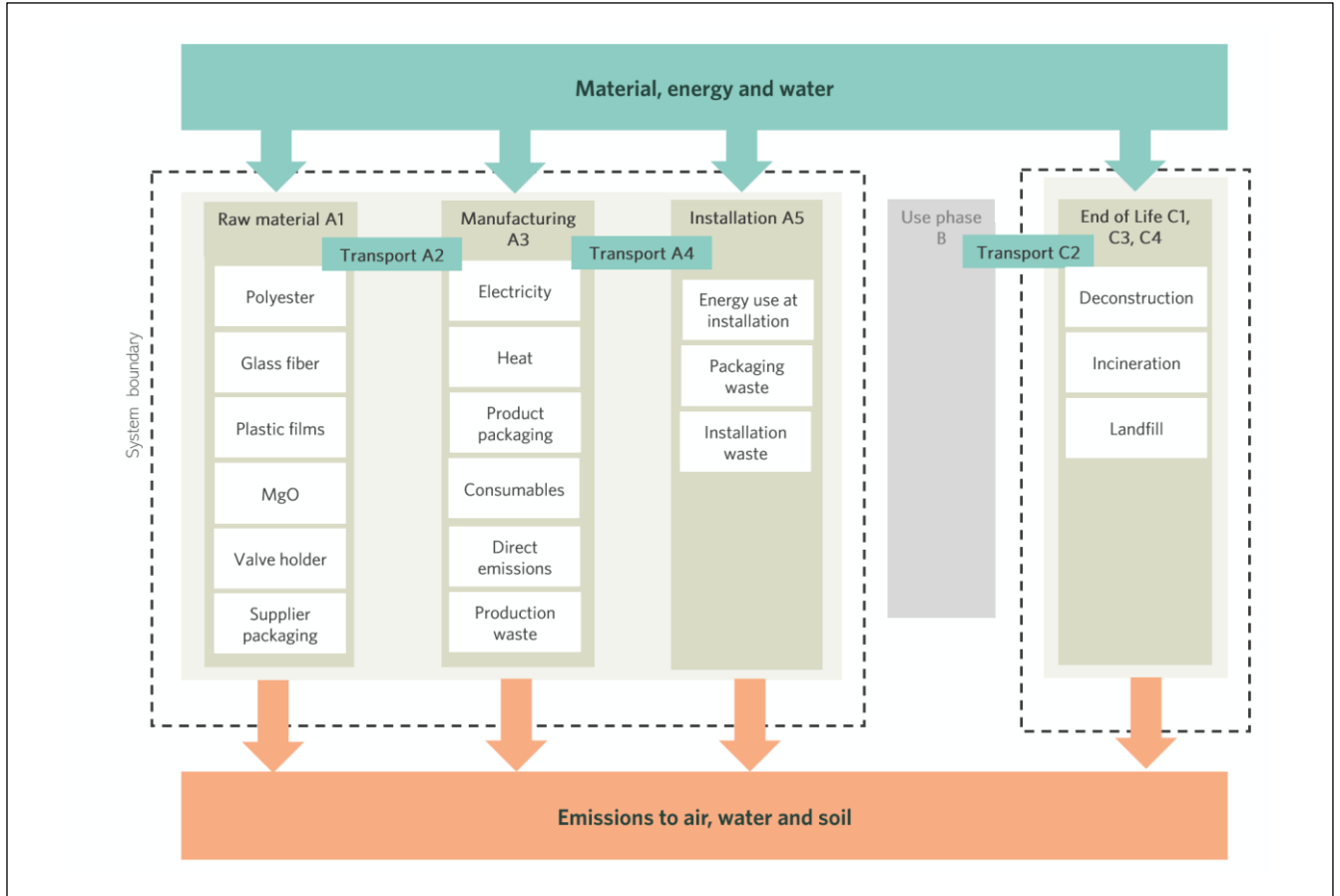
Time representativeness: Manufacturing data is based on the year 2022

Database(s) and LCA software used: Ecoinvent 3.9, Industry Data 2.0, Simapro 9.5

Description of system boundaries: Cradle to the gate with options (A1-A3+C+D with additional modules A4-A5)

Geographical scope: Global

System diagram:



A1 Raw materials

This module covers raw material production, processing, and supplier packaging production.

A2 Transport to manufacturing site

This module covers the transport of raw materials to Inpipe's manufacturing facilities.

A3 Manufacturing

This module covers the manufacturing at Inpipe's manufacturing site. Data on manufacturing is based on the production year 2022. The product is glass fibre armed polyester liners that are used for no-dig repair of pipes. It is produced in Inpipes facilities in Vilhelmina and delivered to the customer in a wooden box and are hardened by the customer at the production site, using UV light.

A4 Transport to site

A Global distribution scenario is transport by truck from Inpipes facilities in Vilhelmina to Gothenburg (1028 km), further via ship to Mumbai (12409km) and truck to the construction site (972km).

A5 Installation

This module covers energy use at installation and waste treatment of customer packaging and installation spillage. The liners are cured with UV radiation. The equipment can be powered by electricity or by fuel. The calculation in this EPD assumes that a diesel generator is used to supply power.

**C1 Deconstruction**

This module includes digging up the pipe at product end-of-life. Normally you install a new liner in the old one 3-4 times before the pipe is too small. It means that end-of-life treatment scenario, C, should be distributed over all liners. Due to uncertainty only one liner is included.

**C2 Transport to waste treatment**

This module covers the transport of the liner to a waste treatment facility at product end-of-life. A transport of 50 km by truck is assumed.

**C3 Waste processing**

This module covers the impact of incineration at product end-of-life. The liner is assumed to go to incineration, where the polyester and the plastic parts are incinerated.

**C4 Disposal**

This module covers the impact of landfilling. The glass fibre that remains after incineration is assumed to be landfilled

**D Reuse-Recovery-Recycling-potential**

This module covers the benefits of energy recovery of the material sent to incineration.

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
Module	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	EUR	EUR	SE	GLO	GLO	-	-	-	-	-	-	-	GLO	GLO	GLO	GLO	GLO
Specific data used	11%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	<10%			-	-	-	-	-	-	-	-	-	-	-	-	-	-

## Content information

Product Components	Weight (kg)	Post-consumer material (weight-%)	Renewable material (weight-%)
Polyester resin	0.454	0%	0%
Glass fibre	0.454	0%	0%
Film (polyethylene)	0.049	0%	0%
Film (polyamide)	0.028	0%	0%
Magnesium oxide	0.014	0%	0%
Total	1	0%	0%
<b>Packaging materials</b>			
Wooden box	0.02	0%	100%
Substances of Very High Concern (SVHC) <sup>1</sup> that exceeds 0.1 weight-%.	No SVHC that exceeds 0.1 weight-%		

<sup>1</sup> SVHC and the Candidate List of SVHC are available via the European Chemicals Agency [Candidate List of substances of very high concern for Authorisation - ECHA \(europa.eu\)](https://echa.europa.eu/candidate-list-table)

## Results of the Environmental Performance Indicators

### Mandatory impact category indicators according to EN 15804

Results per kg liner									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-total	kg CO <sub>2</sub> eq.	3,34E+00	4,96E-01	1,19E-01	4,82E-02	1,22E-02	1,17E+00	5,92E-03	-5,51E-01
GWP-fossil	kg CO <sub>2</sub> eq.	3,36E+00	4,96E-01	8,96E-02	4,82E-02	1,22E-02	1,17E+00	5,87E-03	-4,38E-01
GWP-biogenic	kg CO <sub>2</sub> eq.	-2,23E-02	3,12E-04	2,93E-02	1,62E-05	6,17E-06	9,02E-05	4,76E-05	-1,12E-01
GWP-luluc	kg CO <sub>2</sub> eq.	2,61E-03	2,80E-04	1,33E-05	6,72E-06	6,10E-06	8,88E-06	4,30E-06	-1,10E-03
ODP	kg CFC 11 eq.	1,92E-06	9,95E-09	7,86E-10	8,20E-10	1,76E-10	1,21E-09	1,39E-10	-7,49E-09
AP	mol H <sup>+</sup> eq.	1,78E-02	4,56E-03	5,87E-04	4,35E-04	4,19E-05	2,67E-04	4,18E-05	-2,18E-03
EP-freshwater	kg P eq.	8,34E-04	3,05E-05	2,84E-06	2,23E-06	9,78E-07	3,50E-06	1,54E-06	-4,08E-04
EP-marine	kg N eq.	3,50E-03	1,14E-03	2,64E-04	2,00E-04	1,35E-05	1,53E-04	1,57E-05	-4,03E-04
EP-terrestrial	mol N eq.	3,75E-02	1,24E-02	2,85E-03	2,17E-03	1,43E-04	1,30E-03	1,67E-04	-3,54E-03
POCP	kg NMVOC eq.	1,50E-02	4,06E-03	7,93E-04	6,48E-04	5,52E-05	3,27E-04	5,66E-05	-1,13E-03
ADP-minerals&metals*	kg Sb eq.	1,56E-04	1,33E-06	1,67E-07	2,18E-08	3,81E-08	5,63E-08	1,19E-08	-3,75E-07
ADP-fossil*	MJ	6,42E+01	6,79E+00	6,13E-01	6,28E-01	1,68E-01	2,16E-01	1,27E-01	-1,01E+01
WDP*	m <sup>3</sup>	1,29E+00	2,51E-02	3,07E-03	1,56E-03	7,03E-04	5,32E-02	5,38E-03	-1,04E-01
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 the environmental impact indicators for ADPE, ADPF, WDP, ETP-FW, HTP-C, and HTP-NC shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator. IR 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.*



## Additional mandatory and voluntary impact category indicators

Results per kg liner									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-GHG <sup>2</sup>	kg CO <sub>2</sub> eq.	3,37E+00	4,96E-01	8,97E-02	4,82E-02	1,22E-02	1,17E+00	5,91E-03	-4,41E-01
Particulate matter	disease inc.	1,67E-07	3,12E-08	1,20E-09	1,21E-08	8,44E-10	1,34E-09	9,14E-10	-7,56E-09
Ionising radiation*	kBq U-235 eq	3,31E-01	7,85E-03	3,56E-04	4,28E-04	1,45E-04	4,33E-04	1,62E-04	-2,87E-01
Fresh water ecotoxicity*	PAF .m3 .day	4,67E+01	2,48E+00	3,03E-01	2,19E-01	7,03E-02	2,29E+00	4,13E-02	-4,83E-01
Human toxicity, cancer impacts*	cases	4,66E-09	2,23E-10	1,85E-11	2,34E-11	5,04E-12	1,02E-10	3,35E-12	-1,28E-10
Human toxicity, non-cancer impacts*	cases	8,97E-08	4,17E-09	3,99E-10	1,21E-10	1,15E-10	3,61E-09	3,70E-11	-3,58E-09
Land use*	species.yr	3,05E+01	3,29E+00	5,34E-02	4,52E-02	8,65E-02	6,46E-02	2,90E-01	-1,52E+00

\* Disclaimer: The results of the environmental impact indicators for LU, ADPE, ADPF, WDP, ETP-FW, HTP-C, and HTP-NC shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator. IR 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.

## Resource use indicators

Results per kg liner									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	7,89E+00	9,34E-02	6,80E-03	5,22E-03	2,26E-03	8,87E-03	2,16E-03	-1,94E+00
PERM	MJ	3,80E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	8,27E+00	9,34E-02	6,80E-03	0,00E+00	2,26E-03	8,87E-03	2,16E-03	-1,94E+00
PENRE	MJ	6,89E+01	7,22E+00	6,52E-01	6,68E-01	1,79E-01	2,35E-01	1,35E-01	-1,06E+01
PENRM	MJ	2,02E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	8,91E+01	7,22E+00	6,52E-01	0,00E+00	1,79E-01	2,35E-01	1,35E-01	-1,06E+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	m <sup>3</sup>	2,33E-02	2,97E-04	2,18E-04	6,71E-05	2,87E-05	1,95E-03	1,31E-04	-3,41E-03
Acronyms	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water								

<sup>2</sup> 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<sub>2</sub> is set to zero.

## Waste indicators

Waste and other output flows that are leaving the system (for which the environmental impact of further processing is not included in the results) shall be declared. As all waste flows are included in the model, no values for waste flows leaving the system are presented here.

Results per kg liner									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste disposed	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
Non-hazardous waste disposed	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
Radioactive waste disposed	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

## Output flow indicators

Results per kg liner									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Material for recycling	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
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, electricity	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
Exported energy, thermal	MJ	1.51E+00	0.00E+00	2.16E+00	0.00E+00	0.00E+00	1.59E+01	0.00E+00	0.00E+00

## Biogenic content

Results per kg liner		
Biogenic carbon in the product	kg C	0.0
Biogenic carbon in the packaging	kg C	0.083

## Additional environmental information

The Inpipe Liner is our most in-demand and affordable product, with over 2.5 million meters produced over the years—a technologically advanced solution designed for rehabilitating and reinforcing pipelines without requiring extensive excavation or replacement.

### UV curing

Curing CIPP liners using ultraviolet light offers several advantages, contributing to efficient and effective pipeline rehabilitation. UV curing is a modern and innovative method that uses UV light to rapidly cure the resin within the liner, transforming it into a solid and durable structural layer.

### Rapid curing

UV curing is exceptionally fast compared to traditional steam or hot water methods. The UV light triggers a photochemical reaction within the resin, causing it to harden and cure within minutes. This rapid curing significantly reduces the project timeline, allowing for quicker completion of rehabilitation projects.

### Controlled process

UV curing offers precise control over the curing process. The UV light source can be adjusted to emit the right intensity and wavelength for optimal curing. This control ensures consistent curing throughout the liner, avoiding over-curing or under-curing.

### Energy Efficiency

UV curing requires less energy compared to other methods like steam curing. The energy-efficient nature of UV curing contributes to cost savings and aligns with sustainable practices.

### Reduced Environmental Impact

UV curing produces minimal emissions and waste. It eliminates the need for steam generation or heating associated with other curing methods, reducing carbon emissions and resource consumption.

### Instant Curing

UV curing offers immediate results. The curing begins once the UV light is applied and the liner solidifies in real time. This reduces downtime and allows for faster reinstatement of the rehabilitated pipeline.

## Climate impact per meter liner

The following table shows the weight per meter liner and the climate impact per meter liner for specific liner dimensions. All other impact categories and indicators can be calculated by multiplying the result per kg liner with kg per meter liner.

Table 9 shows the weight per m liner and climate impact (GWP GHG – EN15804) A1-A3 per m liner.

SN class Diameter	SN class 1		SN class 2		SN class 3		SN class 4		SN class 5	
	kg/m	kg CO2e/m	kg/m	kg CO2e/m	kg/m	kg CO2e/m	kg/m	kg CO2e/m	kg/m	kg CO2e/m
∅150									3.00	10.6
∅200					3.80	13.4	4.20	14.8	4.20	14.8
∅225					4.30	15.2	5.10	18.0	5.10	18.0
∅230					5.00	17.7	5.30	18.7	5.30	18.7
∅250	5.00	17.7	5.40	19.1	5.40	19.1	6.10	21.6	6.40	22.6
∅300	5.70	20.1	7.00	24.7	7.80	27.6	8.50	30.0	9.00	31.8
∅350	8.00	28.3	9.40	33.2	10.40	36.8	11.50	40.6	12.00	42.4
∅375	8.50	30.0	10.50	37.1	11.50	40.6	13.00	45.9	14.40	50.9
∅400	10.00	35.3	11.70	41.3	13.00	45.9	14.30	50.5	15.50	54.8
∅450	13.10	46.3	14.60	51.6	16.00	56.5	17.40	61.5	18.70	66.1
∅500	14.60	51.6	17.50	61.8	20.00	70.7	21.60	76.3	23.00	81.3
∅550	18.20	64.3	21.30	75.3	23.80	84.1	25.90	91.5	27.10	95.8
∅600	20.70	73.2	25.00	88.3	27.80	98.2	30.20	106.7	32.00	113.1
∅700	28.50	100.7	33.00	116.6	37.00	130.8	39.30	138.9	41.90	148.1
∅750	31.70	112.0	34.60	122.3	44.60	157.6	47.00	166.1	49.90	176.3
∅800	35.60	125.8	41.80	147.7	47.30	167.2	50.00	176.7		
∅900	45.70	161.5	50.80	179.5	56.80	200.7				
∅1000	51.40	181.6	61.50	217.3						
∅1100	69.60	246.0								
∅1200	80.40	284.1								
∅1300	88.50	312.7								
∅1400	99.60	352.0								
∅1500	102.20	361.2								
∅1600	112.70	398.3								
∅1700	118.50	418.8								
∅1800	132.00	466.5								

## References

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

PCR 2019:14. Construction products, 2019:14, version 1.2.5 valid until 2024-12-20

Lagercrantz, K. Miljögiraff AB, Inpipe Liner and Inpipe Freeline LCA report 1043, 2023-08-31

EN ISO 14025:2014-02 Environmental labels and declarations - Type III environmental declarations - Principles and procedures, Edited in 2010

EN ISO 14040:2006 Environmental management - Life cycle assessment - Principles and framework, 2006

EN ISO 14044:2006 Environmental management - Life cycle assessment - Requirements and guidelines, 2006

