Environmental Product Declaration

of multiple products based on the average results of the product group

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

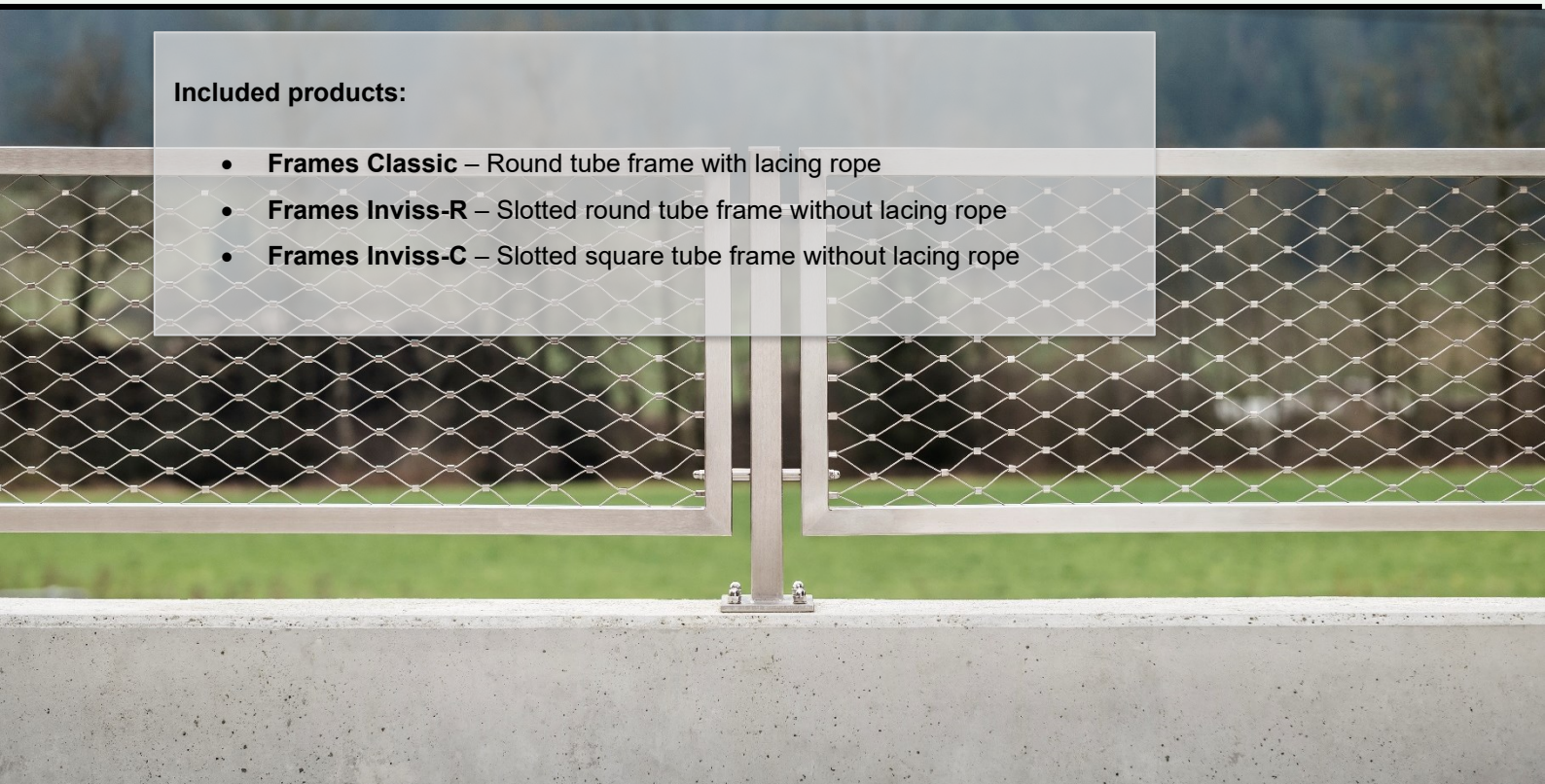
Frames (infilled with Webnet)

from

Jakob AG (Jakob Rope Systems)

Programme:	The International EPD System, www.environdec.com
Programme operator:	EPD International AB
Type of EPD:	EPD of multiple products from a company
EPD registration number:	EPD-IES-0036003:001
Version date:	2026-11-10
Validity date:	2031-11-10

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



Included products:

- **Frames Classic** – Round tube frame with lacing rope
- **Frames Inviss-R** – Slotted round tube frame without lacing rope
- **Frames Inviss-C** – Slotted square tube frame without lacing rope

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

Product Category Rules (PCR)
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): PCR 2019:14 Construction products version 2.0.1
PCR review was conducted by: The Technical Committee of the International EPD® System. A full list of members available on www.environdec.com. Chair of the PCR review: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via info@environdec.com.
c-PCR, if applicable: NA

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: Angela Schindler, Umweltberatung, Tuefinger Str. 12, 88682 Salem, Germany Approved by: 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:
Jakob AG (Jakob Rope Systems)

Address:
Jakob AG, Dorfstrasse 34, 3555 Trubschachen, Switzerland

Contact:
Fabian Graber, fabian.graber@jakob.ch, +41 (0) 34 495 10 27

Description of the organisation:
Jakob Rope Systems develops and provides stainless steel architectural systems and solutions for rope and lifting technology. Its products and services are well established in the market and are sold in over 40 countries worldwide. Production and processing mainly take place at its sites in Trubschachen (Switzerland) and Saigon (Vietnam). Frames are manufactured at the Saigon site. Learn more: www.jakob.com.



Figure 1: Jakob Saigon LTD

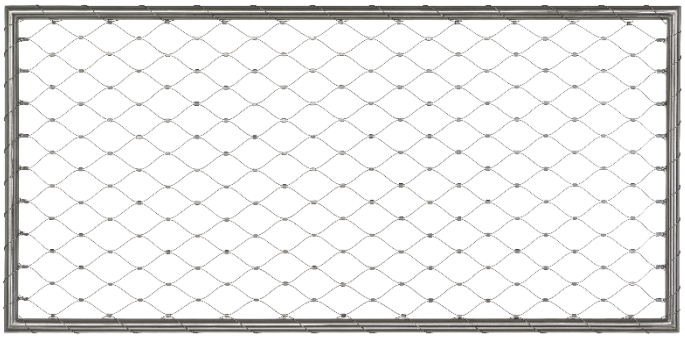
Product-related or management system-related certifications:
Jakob Rope Systems production facility in Saigon has implemented an environmental management system in accordance with the ISO 14001 standard. The production site in Trubschachen has a certified quality management according to the ISO 9001 standard, issued by SQS. The production site in Vietnam has a certified quality management according to the ISO 9001 standard and an environment management according to the ISO 14001 standard, issued by TÜV Rheinland. Frames is approved by the German Institute for Building Technology under approval number Z-14.7-557 for use as horizontal and vertical fall protection.

PRODUCT INFORMATION

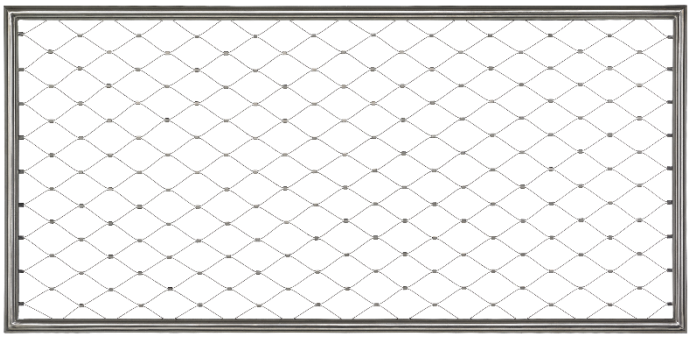
Product name:
Frames

Product identification:
The average product declared corresponds to the average Frames (infilled with Webnet) manufactured at the production site in 2024, calculated by weighting all frames infilled with Webnet manufactured by their production volume in 2024. All varieties of Frames (infilled with Webnet) (according to 2024 sales data) are included in the calculation of the average product and are therefore covered by the present EPD. These include Frames Classic, Frames Inviss-R, and Frames Inviss-C, filled with Webnet with sleeves (“type Micro” and “type Webnet”) or sleeveless Webnet. The different varieties of Frames products are presented below:

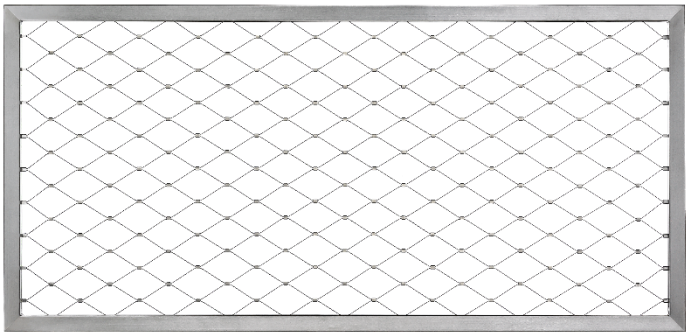
- **Frames Classic** – Round tube frame with lacing rope



- **Frames Inviss-R** – Slotted round tube frame without lacing rope



- **Frames Inviss-C** – Slotted square tube frame without lacing rope



UN CPC code:

412 – Products of iron or steel

Product description:

The Frames architectural solution combines high-quality stainless-steel frames (AISI 326) with Webnet infill (AISI 316/316L, EN 1.4401/1.4404), both made from purchased materials. Available in various configurations with integrated drill holes, brackets, and clamps, Frames allow quick and secure installation, ideal for architecture and construction.

Rectangular and round profiles in multiple sizes meet diverse application requirements. Each Frames system is made individually by Jakob Rope Systems to customer specifications, including special shapes and complex geometries. Production follows EN 1090, ensuring top quality and safety standards.

Frames suit indoor and outdoor use, for applications such as railing infill, façade elements, room dividers, or greening structures. Upon request, Frames and Webnet infills can be coated in the RAL Classic colour spectrum, combining functionality with design flexibility. Durable, corrosion-resistant, and aesthetically clear, Frames provide a high-quality, low-maintenance solution for demanding projects.

Detailed information on the product's technical specifications is shown below and can be found in the Frames catalog available at the Jakob Rope Systems website.

- (https://www.jakob.com/files/6_downloads/catalogues/Jakob-Rope-Systems-Catalogue-Webnet-Frames-F2-Technical.pdf)
- https://www.jakob.com/ch/en/products/architecture/frames

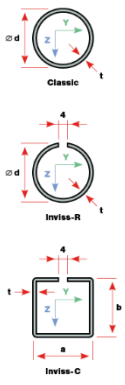
Products covered by EPD:

Frames:

Technical data of Frames including "Frames classic", "Frames Inviss-R", and "Frames Inviss-C" is shown in the table below.

Table 1: Technical information of Frames

According to EN 1993-1-42006 + A12015



Jakob article number	Designation	Frame profile	Cross sectional area	Cross section weight	Moment of inertia	Moment of inertia	Elastic section modulus	Elastic section modulus	Plastic section modulus	Plastic section modulus	Section modulus for torsion	Cross sectional class
Nr. / No / No.		Ø d × t, a × b × t	A	g	I_y	I_z	$W_{el,y}$	$W_{el,z}$	$W_{pl,y}$	$W_{pl,z}$	W_t	
		Ø mm	mm^2	kg/m	mm^4	mm^4	mm^3	mm^3	mm^3	mm^3	mm^3	EN 1993-1-4 Tab. 5.2
30924-0017-40	Classic	17,2 × 1,6	78	0,62	2411	2411	280	280	391	391	561	1
30924-0026-40	Classic	26,9 × 2	156	1,23	12203	12203	907	907	1243	1243	1815	1
30924-0033-40	Classic	33,7 × 2	199	1,56	25119	25119	1491	1491	2012	2012	2981	1
30924-0042-40	Classic	42,4 × 2	254	1,99	51916	51916	2449	2449	3267	3267	4898	1
30924-0026-50	Inviss-R	26,9 × 2	148	1,17	10899	12193	907	907	1)	1)	97	1)
30924-2020-50	Inviss-C	20 × 20 × 1,5	103	0,81	5648	6185	618	618	713	766	52	1
30924-2040-50	Inviss-C	20 × 40 × 1,5	163	1,28	31855	11330	1133	1133	2063	1321	82	1
30924-2550-50	Inviss-C	25 × 50 × 1,5	208	1,63	65268	23106	1848	1848	3327	2120	104	1
30924-3030-50	Inviss-C	30 × 30 × 1,5	163	1,28	21533	22790	1519	1519	1741	1823	82	1
30924-3060-50	Inviss-C	30 × 60 × 1,5	253	1,99	116360	41082	1)	1)	1)	1)	127	4
30924-4040-50	Inviss-C	40 × 40 × 2	293	2,30	69082	72041	3602	3602	4220	4332	1≠97	1

1) Please contact Jakob-Engineering

AISI 316L / EN 1.4404	Steel grade
200000 N/mm²	Modulus of elasticity E (EN 1993-1-4 2.1.3)
220 N/mm²	Yield strength f_y (EN 1993-1-4 Tab. 2.1)
520 N/mm²	Tensile strength f_u (EN 1993-1-4 Tab. 2.1)
7850 kg/m³	Density ρ
16 × 10-6 1/°C	Coefficient of thermal expansion α_t
1.1	Partial safety factor γ_{mp} (EN 1993-1-4 5.1. [2])

Webnet infills:

Webnet products that are used as infills are listed in Frames catalogue which can be found in Webnet catalog at www.jakob.com.

The specifications of these Webnets is shown in (Table 2) and (Table 3).

Table 2: Webnet infills used with Frames

	Rope	Mesh Aperture
Nr. / No / No.	**Ø**	**W × H**
	mm	mm
20261-0100-020	1	20 × 38,2
20261-0100-030	1	30 × 53
20261-0100-040	1	40 × 70,5
20261-0100-050	1	50 × 87,2
20261-0100-060	1	60 × 105
20261-0100-070	1	70 × 122
20261-0100-080	1	80 × 139
20261-0150-025	1.5	25 × 45,46
20261-0150-030	1.5	30 × 60,73
20261-0150-035	1.5	35 × 67,98
20261-0150-040	1.5	40 × 75,18
20261-0150-050	1.5	50 × 91,39
20261-0150-060	1.5	60 × 107,78
20261-0150-070	1.5	70 × 124,78
20261-0150-080	1.5	80 × 141,45
20261-0150-100	1.5	100 × 175,34
20261-0150-120	1.5	120 × 210,36
20261-0150-140	1.5	140 × 244,98
20261-0150-160	1.5	160 × 280,10
20261-0150-180	1.5	180 × 314,33
20261-0150-200	1.5	200 × 348,51
20261-0200-040	2	40 × 75,1
20261-0200-050	2	50 × 90,5
20261-0200-060	2	60 × 107,2
20261-0200-070	2	70 × 124
20261-0200-080	2	80 × 141
20261-0200-100	2	100 × 175
20261-0200-120	2	120 × 209
20261-0200-140	2	140 × 244
20261-0200-160	2	160 × 279
20261-0200-180	2	180 × 313
20256-0300-040	3	40 × 74,8
20256-0300-050	3	50 × 90,5
20256-0300-060	3	60 × 106,6
20256-0300-070	3	70 × 124
20256-0300-080	3	80 × 141
20256-0300-100	3	100 × 175
20256-0300-120	3	120 × 209
20256-0300-140	3	140 × 244
20256-0300-160	3	160 × 279
20256-0300-180	3	180 × 313

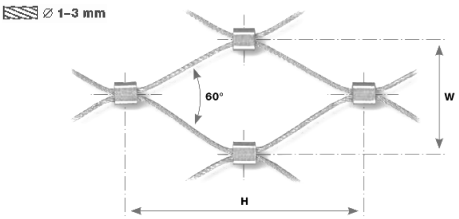
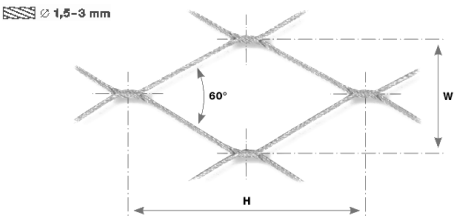


Table 3: Webnet sleeveless infills used with Frames

	Rope	Mesh Aperture
Nr. / No / No.	**Ø**	**W × H**
	mm	mm
20260-0150-025	1,5	25 × 44,61
20260-0150-030	1,5	30 × 60,18
20260-0150-040	1,5	40 × 74,76
20260-0150-050	1,5	50 × 89,74
20260-0150-060	1,5	60 × 105,66
20260-0150-070	1,5	70 × 124,58
20260-0150-080	1,5	80 × 139,56
20260-0150-100	1,5	100 × 174,6
20260-0150-120	1,5	120 × 208,48
20260-0150-140	1,5	140 × 243,06
20260-0150-160	1,5	160 × 277,75
20260-0150-180	1,5	180 × 313,56
20260-0150-200	1,5	200 × 349,88
20260-0200-040	2	40 × 74,8
20260-0200-050	2	50 × 89,72
20260-0200-060	2	60 × 105,72
20260-0200-070	2	70 × 122,35
20260-0200-080	2	80 × 139,57
20260-0200-100	2	100 × 173,48
20260-0200-120	2	120 × 207,52
20260-0200-140	2	140 × 243,06
20260-0200-160	2	160 × 276,27
20260-0200-180	2	180 × 313,17
20260-0300-040	3	40 × 72,42
20260-0300-050	3	50 × 88,26
20260-0300-060	3	60 × 105,66
20260-0300-070	3	70 × 122,46
20260-0300-080	3	80 × 139,49
20260-0300-100	3	100 × 173,32
20260-0300-120	3	120 × 207,26
20260-0300-140	3	140 × 241,74
20260-0300-160	3	160 × 276,52
20260-0300-180	3	180 × 310,96



Name and location of production site(s):
37 HUU NGHI BLVD VSIP THUAN AN TOWN BINH DUONG VN, Vietnam, Jakob Saigon ltd

Manufacturing Process:
The manufacturing process of Frames (infilled with Webnet) begins with the procurement of rectangular or circular welded stainless-steel tubes for the frames, stainless-steel rope for the Webnet, and stainless-steel wires and rods for sleeves and eye-ends.
The welded stainless-steel tubes are cut according to the design drawings. After the sawing process, a laser cutting machine cuts slots in the tubes (to embed Webnet within the frame) and holes for screws and nuts, where required. The tubes are then assembled by welding, and a grinder is used to clean and smooth the welded joints.
The Webnet manufacturing process also begins with cutting the imported ropes according to the design drawings. Externally purchased wires and rods are prepared to produce sleeves and eye-ends. The prepared ropes are passed through the sleeves to achieve the required mesh aperture for each specific Webnet type.
For Frames Classic, the rope is laced around the frame to create the endings. In Frames Inviss-R and Frames Inviss-C, eye-ends at the ends of the Webnet are inserted into the frame slots.

CONTENT DECLARATION

Product content	Mass, kg	Post-consumer recycled material[1], mass-% of product	Biogenic material, mass-% of product	Biogenic material, kg C/product or declared unit
Stainless steel tubes	0.84611	90%[1]	0 %	0
Stainless steel ropes	0.12005	Unknown	0 %	0
Stainless steel sleeves & eye-ends	0.01381	Unknown	0 %	0
Stainless steel screws & struts	0.02003	Unknown	0 %	0
Sum	**1.00**	**76.15%**	**0%**	**0**

[1] Based on certified post-consumer recycled content (supplier declaration linked to steel mill certificate (RSC 2.0).

Modelling of biogenic carbon:
Since module A5 was not declared, the balancing out of the biogenic carbon contained in packaging was included within modules A1-A3, in line with Annex 2, PCR 2019:14 Version 2.0.1.

Packaging materials	Mass, kg[1]	Mass-% (versus the product)	Biogenic material, kg C/product or declared unit
Wooden box	3.67E-03	0.37%	1.63E-03
Wooden pallet	8.33E-04	0.083%	3.71E-04
Carton box	1.67E-03	0.167%	7.09E-04
Plastic Stretch film (PE)	1.50E-03	0.15%	0
Plastic strapping	1.00E-03	0.10%	0
Void fill material (EPS)	5.00E-04	0.05%	0
Total	**9.17-03**	**0.72%**	**2.71E-03**

[1] Number provided here takes reuse of packaging material into account.

1 kg biogenic carbon in the product/packaging is equivalent to the uptake of 44/12 kg of CO_2.

Hazardous substances from the candidate list of SVHC	EC No.	CAS No.	Mass-% per product or declared unit
-	-	-	-

No dangerous substances or materials from the candidate list of SVHC are used.

LCA INFORMATION

Functional unit or Declared unit:
The declared unit is 1 kilogram of Frames (infilled with Webnet), including frame, Webnet (made of ropes, sleeves, loose sleeves, and eye-ends), and fitted with stainless steel parts (screws and struts), ready for installation.

Reference service life:
n/a

Time representativeness:
Data describing the acquisition of raw materials and manufacturing processes covers production year 2024.

Geographical scope:
Raw materials used for production come from global sources, as they are procured from multiple suppliers across different regions and continents.
The product is manufactured in Vietnam.
Frames (infilled with Webnet) is mainly sold in Europe. To conservatively include the impacts of the End-of-life stage in other countries, End-of-life activities are modeled globally.

Database(s) and LCA software used:

This life cycle assessment is based on the Database Ecoinvent version 3.11, as implemented within the software OpenLCA 2.6.2 via this software's EN15804 add-on for Ecoinvent version 3.11. The characterization factors (CF) implemented within this OpenLCA software version correspond to EF v3.1. In alignment with EN 15804, and PCR 2019:14 v.2.0.1, section 4.3.8, characterization factors of long-term flows are set to zero. Infrastructure processes were excluded from the foreground processes of Frames (infilled with Webnet) manufacturing. All upstream processes were modelled using datasets from Ecoinvent version 3.11, which include infrastructure and capital goods.

EPD/LCA Tool used:

n/a

Description of system boundaries:

This life cycle assessment study covers Cradle to gate with modules C1-C4 and module D, i.e. is of type A1-A3 + C + D). In accordance with the requirements of PCR 2019:14 Version 2.0.1, the results of modules A1-A3 are declared in aggregated form.

Construction process stages (A4-A5) and use stages (B1-B7) are not included since highly dependent on the application. In addition, the environmental impact of the use phase can be considered negligible because Frames (infilled with Webnet) is a passive product requiring virtually no maintenance. A more detailed breakdown of what is included in the system boundary, is shown in (Table 5).

Table 5: Inclusions and exclusions in the system boundary

EPD Module	Life Cycle Stages	Definitions
A1	Materials	- Extraction and processing of raw material (stainless steel) and the manufacturing of pre-products (welded stainless steel tubes, screws and struts for Frames; stainless steel rope, stainless steel rod, and wire for Webnet infills) that serve as inputs for the manufacturing processes taking place at Jakob AG's site in Vietnam.
A2	Upstream transport	- Raw material transportation via truck or truck + sea freight from suppliers to the manufacturing site.
A3	Manufacturing	- Consumption of electricity, water and auxiliary materials (oil, welding wire, argon gas, nitrogen gas) associated with sawing, laser cutting, welding and grinding tubes for frame production. - Consumption of electricity associated with cutting ropes to size, and consumption of electricity, water, auxiliary materials (oil, and detergent) associated with manufacturing of sleeves and eye-ends for Webnet production - Production of packaging material used to package Frames (infilled with Webnet). - Treatment of production waste (steel scrap, waste mineral oil) until end-of-waste state, including transportation to treatment facilities. - Note that the manufacturing facilities are not heated.
C1	Deconstruction/Demolition	- Modelled assuming that 0.03 min of mobile diesel crane operation is required per declared unit.
C2	Transport	- Transportation of demolished Frames (infilled with Webnet) to disposal (inert landfill)
C3	Waste processing for recovery	- NA (end-of-waste state of steel scrap considered reached upon demolition of Frames (infilled with Webnet).
C4	Disposal	- Disposal of Frames (infilled with Webnet) on landfill site (assumed percentage of landfilling, main scenario declared: 5%)[2]
D	Impacts and Benefits beyond the system boundary	- Transportation of demolished Frames (infilled with Webnet) and of steel scrap from production site to recycling facility; processing for recycling (sorting and pressing) - Substitution of primary steel production by steel production from 100% recycled steel

[1] In the absence of product-specific data, demolition time was derived from a comparable EPD (YÜCEL BORU VE PROFİL ENDÜSTRİSİ A.Ş. (2023). Steel Tubes for Precision Applications / Welded Cold Sized Square and Rectangular Tubes. EPD S-P-08714. www.environdec.com) and used as proxy input for modelling.

[2] End Of Life stage was modelled assuming 95% recycling and 5% landfilling of Frames infilled with Webnet.

Data quality:
The primary data collection has been carried out in collaboration with Jakob Saigon professionals (Jakob AG manufacturing site in Vietnam). Where specific data was not available like specific data from steel inputs purchased, generic datasets from Ecoinvent have been used. All data used has been included in the LCA Report.

Electricity mix:
A specific electricity mix is used in the manufacturing process, consisting of both self-generated photovoltaic (PV) electricity and purchased electricity from the national grid in Vietnam. Both sources were modeled using the ecoinvent database. Grid electricity was modeled as residual mix, conservatively determining the latter as the consumption mix in Vietnam minus the renewables therein. The combined electricity mix used in the manufacturing process has a GWP-GHG emission factor of 0.596 kg CO_2 eq./kWh.

Cut-off criteria:
In case of uncertainties or missing data, conservative assumptions have been made. Packaging material of inputs and auxiliaries used in A1-A3 and their transport to the manufacturing site were not taken into account since considered outside of the system boundary according to EN 15804 and PCR 2019.14.

Allocation procedures:
The scrap leaving modules A1-A3 in the form of Frames (infilled with Webnet) production waste was modelled by waste allocation, considering the end-of-waste state to be reached at the gate of the Frames (infilled with Webnet) manufacturing site. Both the Frames (infilled with Webnet) scrap leaving modules A1-A3 and the steel originating from the disassembly of Frames (infilled with Webnet) at the end-of-life stage were thus considered in module D. Production inputs and production waste generated in A1-A3 were allocated to Frames (infilled with Webnet) production based on the frame's and infilled Webnet's share of total product output in 2024.
Frames production infilled with Webnet was modelled by modelling 1) Welded stainless steel tube (sawing purchased tubes to size, creating holes and slots inside tubes using laser cutting, welding tube pieces together, etc.) and 2) strut and screws manufacturing.
Infilled Webnet production itself was modelled by modelling 1) Webnet rope production (cutting purchased rope to size) and 2) sleeves and eye-end production (swaging, cutting to size, degreasing, heat treatment, etc.) separately, allocating production inputs and waste to the mentioned unit processes based on process understanding.

Modelling of stainless steel inputs:
Stainless steel inputs used to manufacture Frames infilled with Webnet were modelled using the Ecoinvent dataset 'steel production, chromium steel 18/8, hot rolled – RoW', as implemented in the OpenLCA EN 15804 Add-on based on Ecoinvent version 3.11. This dataset was adjusted to reflect recycled content of steel inputs from different suppliers based on 1) supplier declarations linked to steel mill certificates (where available), or 2) worldstainless data for the supplier. Where neither was available, the Ecoinvent dataset was used without adjustment. Based on the information on recycled content of steel inputs available from supplier declarations and steel mill certificates, complemented by worldstainless and Ecoinvent data, the average recycled content of stainless steel components used to manufacture Frames infilled with Webnet was determined as 90.00% (unfilled frames), 78.35% (Webnet ropes), 67.27% (Webnet sleeves and eye-ends), and 55.08% (screws and struts used in infilled frame assemblage) via a weighted average approach. The average frame infilled with Webnet product was thus determined to have a recycled content of 87.59%.

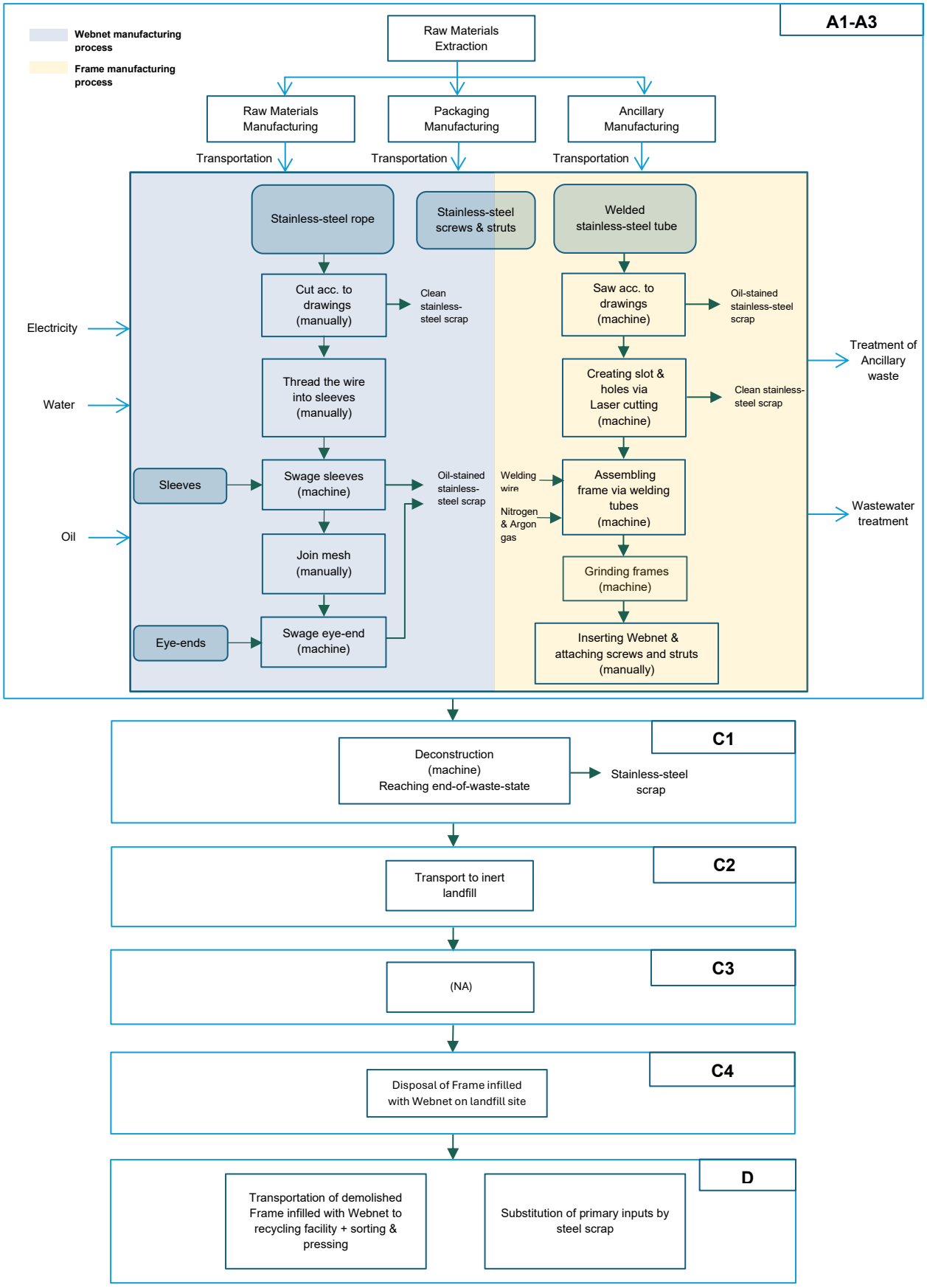
Explanation of product group:

This is an average EPD. The average product declared corresponds to the average Frames (infilled with Webnet) manufactured at the production site in 2024, calculated by weighing all Frames (infilled with Webnet) manufactured by their production volume in 2024. The main differences between the products included lie in the frame dimensions and the product-specific type of Webnet infill (characterized by different rope diameters, mesh apertures, and the number of sleeves and eye-ends). This varying component ratio across product types is the main driver behind the observed variation in indicator results. The observed variation in environmental indicators between different Frames infilled with various Webnet configurations is provided in table 7.

LCA Practitioners:

Seyedehgelareh Sanei, Jakob Rope Systems, with the support of Linda Roberts, Neosys AG

Process flow diagram:



More information:

Recycled stainless steel scrap is an input for Frames and the infilled Webnet. Since its origin is unknown (sourced from scrapyards), it is treated as waste, not as a co-product, in accordance with PCR 2019:14 v.2.0.1.

A summary of the data quality assessment, including data sources, reference years, and the share of primary data, is presented in the (Table 6) in accordance with PCR Section 4.6.4.

Table 6: Data sources, reference years, data categories and share of primary data, calculated based on GWP-GHG results for A1-A3.

Process	Source type	Source	Reference year	Data category	Share of primary data, of GWP-GHG results for A1-A3
Production of stainless-steel inputs	Collected data	EPD owner	2024	Secondary data	0.00%
Manufacturing of product	Collected data	EPD owner	2024	Secondary data	0.00%
Generation of electricity used in manufacturing product	Database	Ecoinvent v3.11 with EN15804 add-on	2008-2020	Primary data*	19.7%
Transportation of steel inputs to the manufacturing site	Database	Ecoinvent v3.11 with EN15804 add-on	2007-2009	Primary data	1.05%
Production of packaging	Database	Ecoinvent v3.11 with EN15804 add-on	2011-2019	Secondary data	0.00%
Total share of primary data, of GWP-GG results for A1-A3					20.77%

*Electricity consumption was largely determined based on measured data, complemented by some conservative assumptions. Though classified as primary data, electricity data quality could be improved further by installing additional meters, thus making measured data fully available.

Disclaimer:The share of primary data is calculated based on GWP-GHG results. It is a simplified indicator for data quality that supports the use of more primary data, to increase the representativeness of and comparability between EPDs. Note that the indicator does not capture all relevant aspects of data quality and is not comparable across product categories.

Modules declared, geographical scope, share of specific data (in GWP-GHG results) and data variation (in GWP-GHG results):

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	**A1**	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Modules declared	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	GLO	GLO	VN	-	-	-	-	-	-	-	-	-		GLO	GLO	GLO	GLO
Share of parimary data	20.77%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	>10%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	N/A			-	-	-	-	-	-	-	-	-	-	-	-	-	-

Description of the system boundary (X = Included in LCA; ND = Not declared; N/A = Not applicable). GLO = global; EU = European Union; VN = Vietnam

ENVIRONMENTAL PERFORMANCE

LCA results of the product(s) - main environmental performance results

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. It is not recommended to use the results of modules A1-A3 without taking into account the results of module C.

Mandatory impact category indicators according to EN 15804

Results per functional or declared unit							
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-fossil	kg CO_2 eq.	5.94E+00	2.46E-03	8.09E-04	0.00E+00	3.13E-04	-4.76E-01
GWP-biogenic	kg CO_2 eq.	1.09E-02	2.71E-07	2.01E-07	0.00E+00	1.08E-07	-6.89E-04
GWP-luluc	kg CO_2 eq.	7.36E-03	2.50E-07	3.62E-07	0.00E+00	1.78E-07	-4.46E-04
GWP-total	**kg CO_2 eq.**	**5.96E+00**	**2.46E-03**	**8.09E-04**	**0.00E+00**	**3.13E-04**	**-4.77E-01**
ODP	kg CFC 11 eq.	4.87E-08	3.62E-11	1.02E-11	0.00E+00	8.71E-12	-3.05E-09
AP	mol H^+ eq.	3.69E-02	1.35E-05	2.76E-06	0.00E+00	2.19E-06	-2.70E-03
EP-freshwater	kg P eq.	3.81E-04	8.54E-09	1.00E-08	0.00E+00	3.06E-09	-4.04E-05
EP-marine	kg N eq.	6.47E-03	6.17E-06	8.59E-07	0.00E+00	8.36E-07	-4.48E-04
EP-terrestrial	mol N eq.	7.00E-02	6.77E-05	9.51E-06	0.00E+00	9.19E-06	-4.98E-03
POCP	kg NMVOC eq.	2.25E-02	2.19E-05	3.74E-06	0.00E+00	3.32E-06	-1.58E-03
ADP-minerals&metals*	kg Sb eq.	8.98E-05	8.98E-10	2.72E-09	0.00E+00	4.69E-10	-1.62E-05
ADP-fossil*	MJ	6.87E+01	3.18E-02	1.12E-02	0.00E+00	7.66E-03	-5.29E+00
WDP*	m3 World eq.	2.77E+00	8.19E-05	5.96E-05	0.00E+00	3.37E-04	-1.91E-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 this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.*

Additional mandatory and voluntary impact category indicators

Results per functional or declared unit							
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-GHG[1]	**kg CO_2 eq.**	**5.96E+00**	**2.46E-03**	**8.09E-04**	**0.00E+00**	**3.13E-04**	**-4.77E-01**
PM	Disease Incidence	4.03E-07	2.89E-10	6.23E-11	0.00E+00	5.03E-11	-4.85E-08
IRP	kBq U235 eq.	1.35E-01	5.29E-06	3.51E-06	0.00E+00	1.78E-06	-1.11E-02
ETP-fw	CTUe	5.32E+01	1.75E-03	2.06E-03	0.00E+00	5.54E-04	-7.75E+00
HTP-c	CTUh	6.46E-09	3.02E-12	1.36E-13	0.00E+00	5.68E-14	-3.68E-10
HTP-nc	CTUh	8.60E-08	7.88E-12	6.95E-12	0.00E+00	1.28E-12	-1.07E-08
SQP	Dimensionless	2.30E+01	2.11E-03	6.57E-03	0.00E+00	1.51E-02	-2.75E+00

[1] This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO_2 is set to zero.

Resource use indicators

Results per functional or declared unit							
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	1.45E+01	2.00E-04	1.55E-04	0.00E+00	7.17E-05	-1.61E+00
PERM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	1.45E+01	2.00E-04	1.55E-04	0.00E+00	7.17E-05	-1.61E+00
PENRE	MJ	6.87E+01	3.18E-02	1.12E-02	0.00E+00	7.66E-03	-5.29E+00
PENRM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ	6.87E+01	3.18E-02	1.12E-02	0.00E+00	7.66E-03	-5.29E+00
SM*	kg	1.12E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.04E-01
RSF	MJ	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
FW	m^3	6.45E-02	2.04E-06	1.50E-06	0.00E+00	7.92E-06	-3.95E-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						

*The SM content of Webnet packaging material has conservatively been set to zero, i.e. packaging material was not included in calculating the SM indicator

Waste indicators

Results per functional or declared unit							
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	3.27E+00	2.84E-05	1.90E-05	0.00E+00	6.19E-06	-5.19E-01
Non-hazardous waste disposed	kg	1.46E+01	2.09E-04	1.08E-04	0.00E+00	8.31E-05	-6.45E-01
Radioactive waste disposed	kg	8.57E-05	3.33E-09	2.21E-09	0.00E+00	1.12E-09	-6.93E-06

Output flow indicators

Results per functional or declared unit							
Indicator	**Unit**	**A1-A3**	**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
Material for recycling	kg	2.73E-01	9.50E-01	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
Exported energy, electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, thermal	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Additional LCA results (other environmental performance results) of the product(s)

Table 7: Minimum, maximum, average, and variation from the average environmental impact values (A-C) for the products covered in this EPD

LCA result of one declared unit product (A-C)	Unit	Min	Representative/ Average	Max	(A-C) Variation %
GWP-fossil	kg CO2 eq.	5.79E+00	5.95E+00	6.60E+00	-2.54% / +10.95%
GWP-biogenic	kg CO2 eq.	1.06E-02	1.09E-02	1.20E-02	-2.87% / +9.95%
GWP-luluc	kg CO2 eq.	6.59E-03	7.36E-03	1.10E-02	-10.49% / +49.41%
GWP-total	**kg CO2 eq.**	**5.81E+00**	**5.96E+00**	**6.62E+00**	**-2.53% / +11.00%**
ODP	kg CFC 11 eq.	5.42E-08	4.88E-08	6.18E-08	11.04% / +26.63%
AP	mol H+ eq.	5.42E-08	4.88E-08	6.18E-08	11.04% / +26.63%
EP-freshwater	kg P eq.	3.70E-04	3.81E-04	4.37E-04	-2.83% / +14.86%
EP- marine	kg N eq.	6.26E-03	6.47E-03	7.11E-03	-3.28% / +9.79%
EP-terrestrial	mol N eq.	6.79E-02	7.01E-02	7.58E-02	-3.11% / +8.19%
POCP	kg NMVOC eq.	2.18E-02	2.25E-02	2.45E-02	-3.04% / +8.90%
ADP-minerals&metals	kg Sb eq.	8.76E-05	8.98E-05	1.14E-04	-2.46% / +26.92%
ADP-fossil	MJ	6.69E+01	6.88E+01	7.53E+01	-2.68% / +9.56%
WDP	m3 World eq.	2.75E+00	2.77E+00	3.15E+00	-0.85% / +13.55%
(GWP-GHG)	**kg CO2 eq.**	**5.81E+00**	**5.96E+00**	**6.62E+00**	**-2.53% / +11.00%**
(PM)	Disease Incidence	3.98E-07	4.03E-07	4.59E-07	-1.41% / +13.74%
(IRP)	kBq U235 eq.	1.32E-01	1.35E-01	1.47E-01	-2.00% / +9.35%
(ETP-fw)	CTUe	5.27E+01	5.32E+01	6.28E+01	-1.01% / +17.91%
(HTP-c)	CTUh	6.41E-09	6.46E-09	7.35E-09	-0.78% / +13.68%
(HTP-nc)	CTUh	8.52E-08	8.60E-08	1.02E-07	-1.00% / +18.91%
(SQP)	Dimensionless	2.39E+01	2.30E+01	2.83E+01	3.77% / +23.01%
(MFR)	kg	1.20E+00	1.22E+00	1.27E+00	-2.00% / +3.98%
(PERE)	MJ	1.43E+01	1.45E+01	1.66E+01	-1.58% / +14.83%
(PERT)	MJ	1.43E+01	1.45E+01	1.66E+01	-1.58% / +14.83%
(PENRE)	MJ	6.69E+01	6.88E+01	7.53E+01	-2.67% / +9.57%
(PENRT)	MJ	6.69E+01	6.88E+01	7.53E+01	-2.67% / +9.57%
(SM)	kg	1.07E+00	1.12E+00	1.16E+00	-4.22% / +3.39%
(FW)	m3	6.40E-02	6.45E-02	7.31E-02	-0.84% / +13.23%
(HWD)	kg	3.20E+00	3.27E+00	4.08E+00	-2.30% / +24.64%
(NHWD)	kg	1.32E+01	1.46E+01	2.04E+01	-9.24% / +40.23%
(RWD)	kg	8.40E-05	8.57E-05	9.35E-05	-2.00% / +9.14%

The results of the equivalent 100% scenarios (100% recycling; 100% landfill) in line with section 4.8.4 of PCR 2019:14 V.2.0.1 are presented in the tables below.

Table 8: Results of scenario 100% recycling at the end-of-life

Indicator	Unit	C1 - 100% Recycling	C2 - 100% Recycling	C3 - 100% Recycling	C4 - 100% Recycling	D - 100% Recycling
GWP-biogenic	kg CO2 eq.	2.71E-07	0.00E+00	0.00E+00	0.00E+00	-1.02E-03
GWP-fossil	kg CO2 eq.	2.46E-03	0.00E+00	0.00E+00	0.00E+00	-7.04E-01
GWP-luluc	kg CO2 eq.	2.50E-07	0.00E+00	0.00E+00	0.00E+00	-6.60E-04
GWP-total	**kg CO2 eq.**	**2.46E-03**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**-7.05E-01**
ADPF	MJ	3.18E-02	0.00E+00	0.00E+00	0.00E+00	-7.83E+00
ADPE	kg Sb eq.	8.98E-10	0.00E+00	0.00E+00	0.00E+00	-2.39E-05
AP	mol H+ eq.	1.35E-05	0.00E+00	0.00E+00	0.00E+00	-3.99E-03
ODP	kg CFC-11 eq.	3.62E-11	0.00E+00	0.00E+00	0.00E+00	-4.50E-09
EP-freshwater	kg P eq.	8.54E-09	0.00E+00	0.00E+00	0.00E+00	-5.97E-05
EP-marine	kg N eq.	6.17E-06	0.00E+00	0.00E+00	0.00E+00	-6.63E-04
EP-terrestrial	mol N eq.	6.77E-05	0.00E+00	0.00E+00	0.00E+00	-7.37E-03
POCP	kg NMVOC eq.	2.19E-05	0.00E+00	0.00E+00	0.00E+00	-2.34E-03
WDP	m3 World eq.	8.19E-05	0.00E+00	0.00E+00	0.00E+00	-2.83E-01
GWP-GHG	**kg CO2 eq.**	**2.46E-03**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**-7.05E-01**
ETP-fw	CTUe	1.75E-03	0.00E+00	0.00E+00	0.00E+00	-1.15E+01
HTP-nc	CTUh	7.88E-12	0.00E+00	0.00E+00	0.00E+00	-1.58E-08
HTP-c	CTUh	3.02E-12	0.00E+00	0.00E+00	0.00E+00	-5.45E-10
IRP	kBq U235 eq.	5.29E-06	0.00E+00	0.00E+00	0.00E+00	-1.64E-02
PM	Disease Incidence	2.89E-10	0.00E+00	0.00E+00	0.00E+00	-7.17E-08
SQP	Dimensionless	2.11E-03	0.00E+00	0.00E+00	0.00E+00	-4.07E+00
CRU	kg	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
EET	MJ	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
MFR	kg	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ	3.18E-02	0.00E+00	0.00E+00	0.00E+00	-7.83E+00
PERT	MJ	2.00E-04	0.00E+00	0.00E+00	0.00E+00	-2.39E+00
FW	m3	2.04E-06	0.00E+00	0.00E+00	0.00E+00	-5.85E-03
PENRE	MJ	3.18E-02	0.00E+00	0.00E+00	0.00E+00	-7.83E+00
PENRM	MJ	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
PERE	MJ	2.00E-04	0.00E+00	0.00E+00	0.00E+00	-2.39E+00
PERM	MJ	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
SM	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.54E-01
HWD	kg	2.84E-05	0.00E+00	0.00E+00	0.00E+00	-7.68E-01
NHWD	kg	2.09E-04	0.00E+00	0.00E+00	0.00E+00	-9.53E-01
RWD	kg	3.33E-09	0.00E+00	0.00E+00	0.00E+00	-1.02E-05

Table 9: Results of scenario 100% inert landfill at the end-of-life

Indicator	Unit	C1 - 100% Landfill	C2 - 100% Landfill	C3 - 100% Landfill	C4 - 100% Landfill	D - 100% Landfill
GWP-biogenic	kg CO2 eq.	2.71E-07	4.03E-06	0.00E+00	2.15E-06	4.94E-03
GWP-fossil	kg CO2 eq.	2.46E-03	1.62E-02	0.00E+00	6.26E-03	1.30E+00
GWP-luluc	kg CO2 eq.	2.50E-07	7.24E-06	0.00E+00	3.56E-06	2.47E-03
GWP-total	**kg CO2 eq.**	**2.46E-03**	**1.62E-02**	**0.00E+00**	**6.26E-03**	**1.31E+00**
ADPF	MJ	3.18E-02	2.24E-01	0.00E+00	1.53E-01	7.58E+00
ADPE	kg Sb eq.	8.98E-10	5.44E-08	0.00E+00	9.37E-09	1.23E-04
AP	mol H+ eq.	1.35E-05	5.52E-05	0.00E+00	4.38E-05	1.31E-02
ODP	kg CFC-11 eq.	3.62E-11	2.05E-10	0.00E+00	1.74E-10	-7.65E-09
EP-freshwater	kg P eq.	8.54E-09	2.01E-07	0.00E+00	6.12E-08	2.95E-04
EP-marine	kg N eq.	6.17E-06	1.72E-05	0.00E+00	1.67E-05	9.19E-04
EP-terrestrial	mol N eq.	6.77E-05	1.90E-04	0.00E+00	1.84E-04	1.03E-02
POCP	kg NMVOC eq.	2.19E-05	7.48E-05	0.00E+00	6.63E-05	1.02E-03
WDP	m3 World eq.	8.19E-05	1.19E-03	0.00E+00	6.73E-03	1.36E+00
GWP-IOBC/GHG	**kg CO2 eq.**	**2.46E-03**	**1.62E-02**	**0.00E+00**	**6.26E-03**	**1.31E+00**
ETP-fw	CTUe	1.75E-03	4.12E-02	0.00E+00	1.11E-02	5.62E+01
HTP-nc	CTUh	7.88E-12	1.39E-10	0.00E+00	2.56E-11	6.48E-08
HTP-c	CTUh	3.02E-12	2.72E-12	0.00E+00	1.14E-12	2.55E-09
IRP	kBq U235 eq.	5.29E-06	7.02E-05	0.00E+00	3.56E-05	7.89E-02
PM	Disease Incidence	2.89E-10	1.25E-09	0.00E+00	1.01E-09	1.96E-07
SQP	Dimensionless	2.11E-03	1.31E-01	0.00E+00	3.01E-01	1.57E+00
CRU	kg	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
EET	MJ	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
MFR	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ	3.18E-02	2.24E-01	0.00E+00	1.53E-01	7.58E+00
PERT	MJ	2.00E-04	3.11E-03	0.00E+00	1.43E-03	1.26E+01
FW	m3	2.04E-06	3.00E-05	0.00E+00	1.58E-04	2.73E-02
PENRE	MJ	3.18E-02	2.24E-01	0.00E+00	1.53E-01	7.58E+00
PENRM	MJ	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
PERE	MJ	2.00E-04	3.11E-03	0.00E+00	1.43E-03	1.26E+01
PERM	MJ	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
SM	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-8.46E-01
HWD	kg	2.84E-05	3.80E-04	0.00E+00	1.24E-04	4.15E+00
NHWD	kg	2.09E-04	2.16E-03	0.00E+00	1.66E-03	4.88E+00
RWD	kg	3.33E-09	4.42E-08	0.00E+00	2.24E-08	4.91E-05

ABBREVIATIONS

Abbreviation	Definition
General Abbreviations	
EN	European Norm (Standard)
EPD	Environmental Product Declaration
EF	Environmental Footprint
GPI	General Programme Instructions
ISO	International Organization for Standardization
LCA	Life Cycle Assessment
PCR	Product Category Rules
c-PCR	Complementary Product Category Rules
CEN	European Committee for Standardization
CLC	Co-location centre
CPC	Central product classification
GHS	Globally harmonized system of classification and labelling of chemicals
GRI	Global Reporting Initiative
Environmental Impact Indicators (EN 15804)	
GHG	Greenhouse gas
GWP	Global Warming Potential (kg CO_2 eq.)
GWP-fossil	Global Warming Potential from fossil sources (kg CO_2 eq.)
GWP-biogenic	Global Warming Potential from biogenic sources (kg CO_2 eq.)
GWP-luluc	Global Warming Potential from land use and land use change (kg CO_2 eq.)
GWP-total	Total Global Warming Potential (kg CO_2 eq.)
GWP-GHG	Global Warming Potential for greenhouse gases (kg CO_2 eq.)
ODP	Ozone Depletion Potential (kg CFC-11 eq.)
AP	Acidification Potential (mol H^+ eq.)
EP	Eutrophication Potential
EP-freshwater	Freshwater eutrophication potential (kg P eq.)
EP-marine	Marine eutrophication potential (kg N eq.)
EP-terrestrial	Terrestrial eutrophication potential (mol N eq.)
POCP	Photochemical Ozone Creation Potential (kg NMVOC eq.)
ADP	Abiotic Depletion Potential
ADP-minerals&metals	Abiotic depletion potential for non-fossil resources (kg Sb eq.)
ADP-fossil	Abiotic depletion potential for fossil resources (MJ)
WDP	Water Deprivation Potential (m^3)
Resource Use Indicators	
PERE	Use of renewable primary energy excluding renewable primary energy resources used as raw materials (MJ)
PERM	Use of renewable primary energy resources used as raw materials (MJ)
PERT	Total use of renewable primary energy resources (MJ)
PENRE	Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials (MJ)
PENRM	Use of non-renewable primary energy resources used as raw materials (MJ)
PENRT	Total use of non-renewable primary energy resources (MJ)
SM	Use of secondary material (kg)
RSF	Use of renewable secondary fuels (MJ)
NRSF	Use of non-renewable secondary fuels (MJ)
FW	Use of net fresh water (m^3)
Waste Indicators	
HW	Hazardous Waste (disposed) (kg)
NHW	Non-Hazardous Waste (disposed) (kg)
RW	Radioactive Waste (disposed) (kg)
Output Flow Indicators	
CFR	Components for Reuse (kg)
MR	Material for Recycling (kg)
MER	Materials for Energy Recovery (kg)
EEE	Exported Energy, Electricity (MJ)

EET	Exported Energy, Thermal (MJ)
Lifecycle Stages / Modules	
A1	Raw material supply
A2	Transport
A3	Manufacturing
A4	Transport to site
A5	Construction/Installation
B1	Use
B2	Maintenance
B3	Repair
B4	Replacement
B5	Refurbishment
B6	Operational energy use
B7	Operational water use
C1	Deconstruction/Demolition
C2	Transport to waste processing
C3	Waste processing
C4	Disposal
D	Reuse-Recovery-Recycling potential
Other Relevant Terms	
SVHC	Substances of Very High Concern
EC No.	European Community Number
CAS No.	Chemical Abstracts Service Number
MJ	Megajoule
kg	Kilogram
m^3	Cubic Meter
NMVOC	Non-Methane Volatile Organic Compounds
Sb eq.	Antimony Equivalents
P eq.	Phosphorus Equivalents
N eq.	Nitrogen Equivalents
CFC-11 eq.	Chlorofluorocarbon-11 Equivalents
CO_2 eq.	Carbon Dioxide Equivalents
kg C	Kilograms of Carbon
kg CO_2 eq.	Kilograms of Carbon Dioxide Equivalent
ND	Not Declared

Differences versus previous versions

This EPD is a new creation and is not based on the existing EPD.

REFERENCES

GPI (2025) General Programme Instructions for the International EPD® System, Version 5.0.1

PCR 2019:14 VERSION 2.0.1 (2019) Product Category Rules Construction Products PCR 2019:14 VERSION 2.0.1

ecoinvent v3.11 (2024): Ecoinventory database version 3.11 of the Swiss Centre for Life Cycle Inventories, Dübendorf.

https://worldstainless.org/sustainability/environment/recycling/

https://www.jakob.com

Norms
ISO 14040 DIN EN ISO 14040:2006: Environmental management – Life cycle assessment – Principles and framework

ISO 14044 DIN EN ISO 14044:2006: Environmental management – Life cycle assessment – Requirements and guidelines

EN 15804 + A2 EN15804:2012+A2:2019+AC:2021: Sustainability of construction works – Environmental Product Declarations – Core rules for the product category of construction products

EPD
INTERNATIONAL EPD SYSTEM
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