Environmental Product Declaration

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

GLASS FIBRE MESH (LENO) product

from

MASTERPLAST Nyrt.

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	EPD-IES-0021520
Publication date:	2025-04-28
Valid until:	2030-04-27

Product recently on the market – Results of this EPD based on 1 year of production.
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

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:	info@environdec.com

Accountabilities for PCR, LCA and independent, third-party verification
Product Category Rules (PCR)
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): *PCR – Construction Products (PCR 2019:14, version 1.3.4) and UN CPC 26890 Woven fabrics (including narrow fabrics) of glass fibres*
PCR review was conducted by: *The Technical Committee of the International EPD System. See www.environdec.com for a list of members. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat www.environdec.com/contact*.
Life Cycle Assessment (LCA)
LCA accountability: *Ágnes Elvira Farkas, Balázs Sándor Gál* - Bay Zoltán Nonprofit Ltd. for Applied Research
Third-party verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☒ EPD verification by individual verifier Third-party verifier: Vladimir Koci Vlad.Koci@vscht.cz Approved by: The International EPD® System as individual verifier for the third-party verification
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 registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025."

Company information

Owner of the EPD: **Masterplast Nyrt.**
H-8143, Sárszentmihály, Árpád str 1, Hungary
https://www.masterplastgroup.com/
Contact: *Illés Jancsó,* Deputy CEO, jancsoilles@masterplast.hu

Description of the organisation: The Masterplast group, founded in 1997, is the largest Hungarian-owned construction material manufacturing company in the Central European region. With its subsidiaries, it ensures direct market presence in 10 European countries and is present in the majority of European countries through its export partners. It has a decisive position in the market of facade thermal insulation, high-roof insulation and dry construction system components. Its product background is primarily ensured by production and strategic manufacturer collaborations at its ISO and TÜV certified manufacturing bases in Hungary, Serbia and Germany.

Masterplast provides competitive business services to its partners with a built-in customer-oriented sales system, continuous monitoring of the quality of manufactured and distributed products, a stable product supply background and flexible logistics solutions. The company considers the aspects of sustainability, energy efficiency and environmental protection to be extremely important both in its internal processes and in the production and development of its products.

Name and location of production site:
The Masterplast group has production sites in 9 different locations, producing different products. glass fibre mesh product is manufactured in Subotica, Serbia.
Masterplast Proizvodnja d.o.o - Bodrogvari Ferenc str. 172., 24000 Subotica, Serbia

Product information

Product name: **Glass fibre mesh (Leno) product**

Product description:
The Glass Fibre Mesh (LENO) produced by Masterplast is most often used for reinforcing the cement levelling and bedding layers of facade insulation systems and also play a key role in increasing energy efficiency and achieving the EU's zero neutrality goals. As part of the company's commitment to sustainable architecture, Masterplast products contribute to reducing the carbon emissions of buildings, which is not only essential for environmental protection, but also offers significant benefits to consumers by reducing heating and cooling costs.

Product components and materials:
The raw material for LENO products is glass fibres. For the manufacturing of product the further materials are necessary:

- Polyester fibres
- Coating materials (eg. latex and paint)
- Packaging materials
    - pallet and expander
    - card box
    - paper tube
    - packaging films

Masterplast is not adding any other materials to the product during the manufacturing.

Constructional data of Leno product

Parameter	Standard	Unit	Leno
Length	MDV	m	10-1400 (±1%)
Width	EAD 040016-00-0404,2.2.5	cm	10-110 (±1%)
Mesh size (MD/CMD-warp/weft)	EAD 040016-00-0404,2.2.4	mm	(4x4,2) ±0,5-(10x10,2) ±1
Mesh opening (MD/CMD-warp/weft)	EAD 040016-00-0404,2.2.4	mm	(3,5x3,1)-(9,4 x 8,9)±0,5
Weaving accuracy	EAD 040016-00-0404,2.2.6	-	pass
Treated fabric weight	EAD 040016-00-0404,2.2.8	g/m^2	75-210 (±5%)
Thickness	EAD 040016-00-0404,2.2.9	mm	0,30-0,80 (±0,07)
Reaction to fire	EAD 040016-00-0404,2.2.1 EN 13501-1	-	NPD
Organic content	EAD 040016-00-0404,2.2.2	%	14-28 (±4)
Average calorific value	EAD 040016-00-0404,2.2.3; EN ISO 1716	MJ/kg	6,61
		MJ/m^2	1,05
Average tensile strength (MD/CMD-warp/weft)	EAD 040016-00-0404,2.2.7; (ETAG 004, 5.6.7.1.1)	N/5cm	800-3000
Elongation (MD/CMD-warp/weft)	EAD 040016-00-0404,2.2.7; (ETAG 004, 5.6.7.1.1)	%	4,5
Average tensile strength after ageing (MD/CMD-warp/weft)	EAD 040016-00-0404,2.2.7; (ETAG 004, 5.6.7.1.2)	N/5cm	Min 1000*
		%	min 50
Elongation after ageing (MD/CMD-warp/weft)	EAD 040016-00-0404,2.2.7; (ETAG 004, 5.6.7.1.2)	%	3,5

UN CPC code: 26890 Woven fabrics (including narrow fabrics) of glass fibres.
Geographical scope:
The majority of the raw materials (A1) are produced in Europe and China, the product is manufactured (A3) in Serbia (RS-24000 Subotica, Dr. Bodrogvari Ferenc 172.), the end-of-life phase also takes place (C1-C4 and D modules) in Europe.
The Leno products are manufactured in RS-24000 Subotica, Dr. Bodrogvari Ferenc 172. in Serbia.

LCA information

Declared unit: The declared unit of the life cycle assessment is **1000kg of average glass fibre mesh product** at the factory gate ready for distribution.
The analysis is based on production data from a 1-year period to ensure the data is representative and to avoid any seasonality effects.

Reference service life (RSL): The expected service life for LENO glass fibre mesh is 50 years

Time representativeness: 2023.01.01 – 2023.12.31 for Subotica, plants

Database(s) and LCA software used:
The LCA model for production was made using the LCA for Experts software system for life cycle engineering, developed by Sphera (version 10, 2024).
Applied databases are:

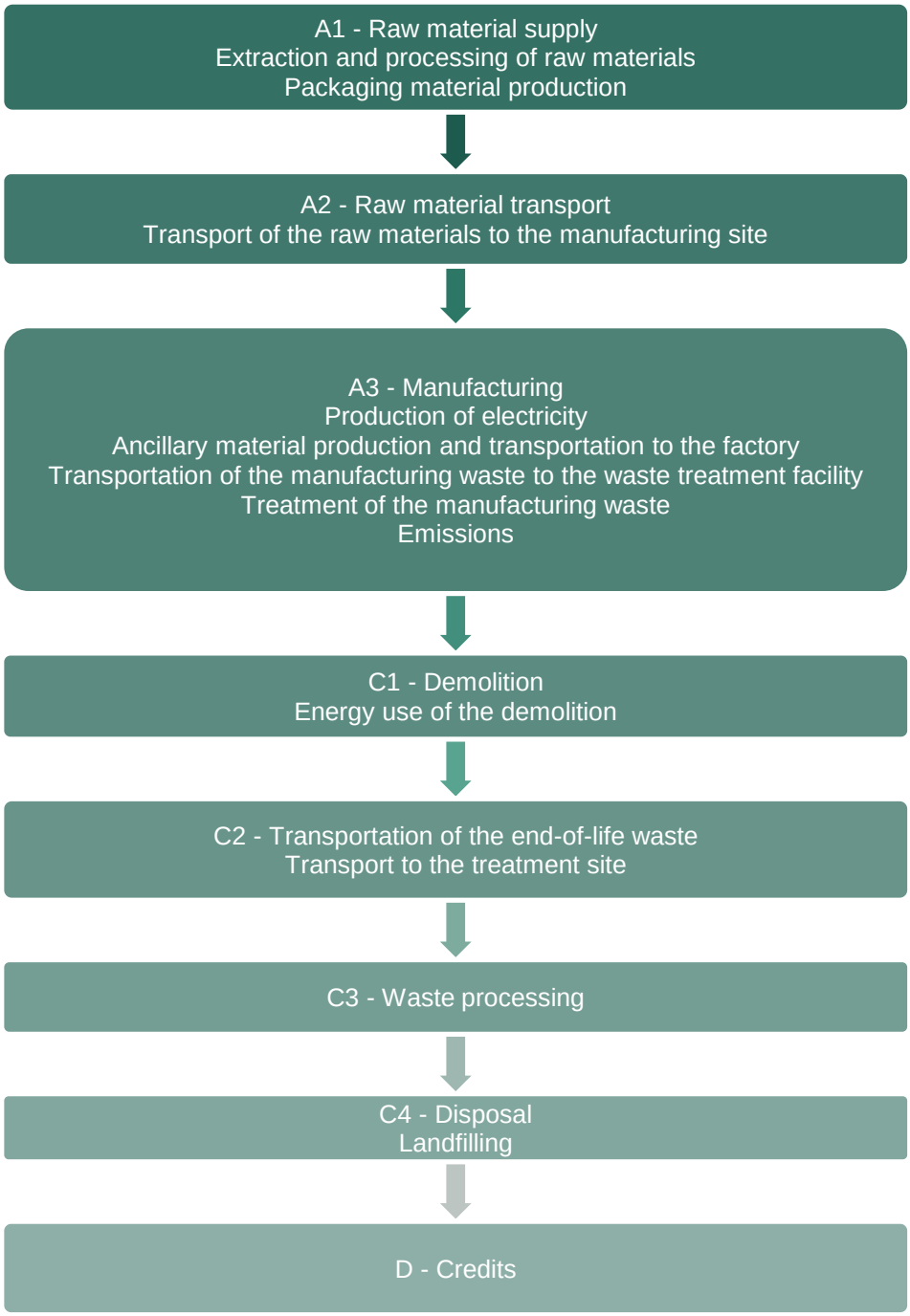
- Managed LCA content (Sphera) database (version 10, 2024),
- Ecoinvent database (version 3.10, 2024).

Description of system boundaries:
The system boundary of this study is cradle to gate with module, C1-C4 and module D, this includes all the mandatory modules according to the PCR.

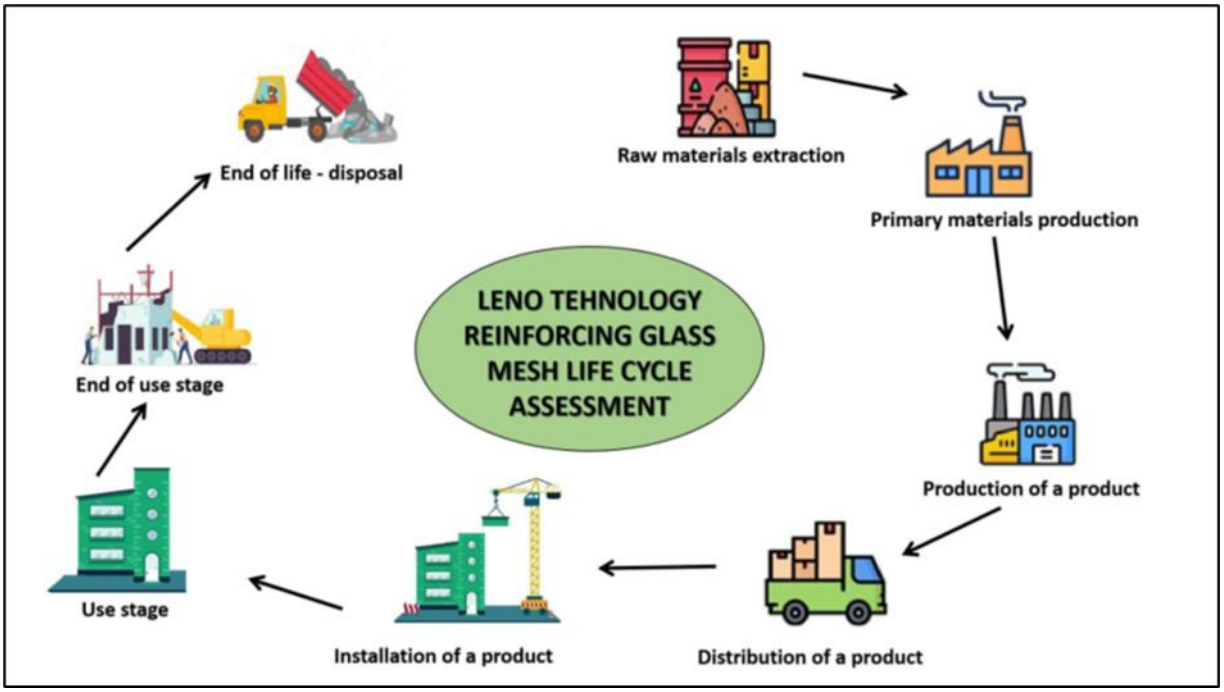
Allocation:
All data that were used for the analysis are provided by Masterplast. No allocation was required during the data collection.
During the production processes, by-products are generated in beside to the main products. The difference between the main- and the by-product is mainly esthetical, but in all other aspects, such as physical properties and usability, they are the same as the main product. According to the company, the economic value of the main and by-products is almost the same, the difference is less than 20%. Therefore, it was not necessary to apply an allocation.

Cut-off criteria:
Cut-off rules are generally applied according to the EN15804:2012+A2 Standard and Construction Products PCR, namely minimum of 99% of the declared environmental impacts shall be included.
Cut-off rules were not needed to be applied. In some cases, proxy data were used to achieve 100% completeness, as this is better than data gaps.

System diagram:



Process diagram of Leno manufacturing process (A3)



Scenario information:

End-of life methodology (C Module)
Demolition (C1): Limited information is available on the energy demand of demolitions and no information was available for the removal of the GFM product specifically. The most common building structure in the market served by Masterplast is concrete, so the general energy of the demolition of a concrete structure was assumed, which is 0,07 MJ/kg according to the JRC report[1].
100% of waste is assumed to be collected separately, so the weight of the End-of-life waste is equal to the declared unit.
Transport to waste processing (C2): The transport distance was assumed to be 50 km and the transportation method to be a truck
Waste processing (C3): With the current technological practices, there is no possibility to recycle the waste, that originates from the analysed products. Therefore, this stage has no effect on the life cycle impacts of products.
Disposal (C4): The 100%-of waste from the EoL of GFM is assumed to end up on a landfill, based on the company information.

Data quality
At the selection of the most suitable process, it is important to apply the local – country specific – process. Therefore, the country specific processes were chosen, for example in case of the electricity, thermal energy, process steam, but other cases – when there was no typical country specific process available – average European processes were selected. In some cases, only processes from other European countries were available.
Generic data used in the LCA study are not older than 5 years and site-specific data are not older than 2 years.

[1] JRC Report - Model for Life Cycle Assessment (LCA) of buildings (2018)

Documentation of the used energy

Module	Process				
	Name	Provider	Reference year	Validity	Factor (kg CO_2eq / kWh)
A3	RS: electricity, medium voltage, residual mix	Ecoinvent	2023	-	1,221
C	RER: Electricity grid mix	Sphera	2021	2027	0,320

Electricity grid factors used in the Study (kg CO_2 eq./ kWh) - Source: GaBi professional 10.
Characterisation factor: EN15804+A2 (based on EF3.1), Climate Change - total

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	RS	-	-	-	-	-	-	-	-	-	RER	RER	RER	RER	RER
Specific data used	14,46%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-

When a module is accounted for, the box in the last row is then marked with an “X“.

When a module is not accounted for, the box in the last row is then marked with “ND“, not declared.

Content information

Product components	Weight [kg]	Post-consumer material, weight-%	Biogenic material, (weight % and kg C/kg)
raw fiberglass mesh	786,67-869,23	0	-
coating	130,77-213,33	0	-
TOTAL	**1000**	0	-
Packaging materials	**Weight [kg]**	**Weight-% (versus the product)**	
Paper box	19,908	1,72%	100%; 0,067 kg C/kg
Strach foil	3,833	0,33%	-
PE bag	0,131	0,01%	-
Paper tube	22,531	1,94%	100%; 0,067 kg C/kg
Pallet	89,069	7,67%	100%; 0,383 kg C/kg
Pallet Expander	25,293	2,18%	100%; 0,476 kg C/kg

Environment/ hazardous properties: No substance listed under the REACH Regulation is present in this product, either above the limits for registration with the European Chemicals Agency or in excess of 0,1 weight-% of the product.

Results of the environmental performance indicators

The environmental impacts of the declared unit for the following impact categories were reported in the EPD according to EN 15804:2012+A2:2019/AC:2021.

Mandatory impact category indicators according to EN 15804:2012+A2:2019/ AC:2021

Results per declared unit (1000 kg of Leno reinforcing mesh)							
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	kg CO_2 eq.	3,27E+03	6,22E+00	4,71E+00	0,00E+00	8,87E+02	0,00E+00
GWP-fossil	kg CO_2 eq.	3,27E+03	6,14E+00	4,66E+00	0,00E+00	8,67E+01	0,00E+00
GWP-biogenic	kg CO_2 eq.	0,00E+00	6,31E-02	0,00E+00	0,00E+00	8,00E+02	0,00E+00
GWP-luluc	kg CO_2 eq.	5,65E+00	2,03E-02	4,79E-02	0,00E+00	-8,58E-03	0,00E+00
ODP	kg CFC 11 eq.	3,41E-05	1,40E-10	7,72E-13	0,00E+00	-4,76E-10	0,00E+00
AP	mol H^+ eq.	2,41E+01	1,35E-02	8,73E-03	0,00E+00	2,16E-01	0,00E+00
EP-freshwater	kg P eq.	1,16E+00	1,31E-05	1,25E-05	0,00E+00	2,09E-02	0,00E+00
EP-marine	kg N eq.	4,99E+00	3,23E-03	3,74E-03	0,00E+00	2,24E-01	0,00E+00
EP-terrestrial	mol N eq.	5,08E+01	3,62E-02	4,00E-02	0,00E+00	8,42E-01	0,00E+00
POCP	kg NMVOC eq.	1,55E+01	8,01E-03	7,86E-03	0,00E+00	5,29E-01	0,00E+00
ADP- minerals& metals*	kg Sb eq.	2,45E-01	1,28E-06	3,09E-07	0,00E+00	-3,03E-06	0,00E+00
ADP-fossil*	MJ	5,46E+04	1,25E+02	5,96E+01	0,00E+00	2,39E+02	0,00E+00
WDP*	m^3	1,19E+03	1,54E+00	2,13E-02	0,00E+00	-2,81E+00	0,00E+00
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption						

** Disclaimers:*

•"Product recently on the market – Results of this EPD shall be used with care as the LCI data is not yet based on 1 year of production which may result in increased uncertainty"

•Infrastructure/capital goods are excluded in upstream, core and downstream processes.

•The results of modules A1-A3 should not be used without considering the results of module C.

•The environmental impacts of the declared unit for the following results of the indicators and the corresponding disclaimers were reported in the EPD according to EN 15804:2012+A2:2019/AC:2021, JRC characterization factors (based on EF3.1).

•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.

Additional mandatory and voluntary impact category indicators

Results per declared unit (1000 kg of Leno reinforcing mesh)							
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-GHG	kg CO_2 eq.	3,27E+03	6,16E+00	4,71E+00	0,00E+00	8,67E+01	0,00E+00
Additional voluntary indicators e.g. the voluntary indicators from EN 15804 or the global indicators according to ISO 21930:2017							

There was no need to add additional voluntary indicators

Resource use indicators

Results per declared unit (1000 kg of Leno reinforcing mesh)							
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	5,29E+03	8,57E+01	4,49E+00	0,00E+00	-2,72E+02	0,00E+00
PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	5,29E+03	8,57E+01	4,49E+00	0,00E+00	-2,72E+02	0,00E+00
PENRE	MJ	5,46E+04	1,25E+02	5,96E+01	0,00E+00	2,39E+02	0,00E+00
PENRM	MJ	0,00E+00	-2,00E-12	0,00E+00	0,00E+00	4,01E-12	0,00E+00
PENRT	MJ	5,46E+04	1,25E+02	5,96E+01	0,00E+00	2,39E+02	0,00E+00
SM	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	2,13E+03	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	2,77E+01	6,65E-02	2,22E-03	0,00E+00	-1,69E-01	0,00E+00
Acronyms	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water						

Waste indicators

Results per declared unit (1000 kg of Leno reinforcing mesh)							
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	9,07E+01	1,64E-07	2,39E-09	0,00E+00	-5,59E-07	0,00E+00
Non-hazardous waste disposed	kg	1,40E+02	9,71E-02	8,32E-03	0,00E+00	8,08E+02	0,00E+00
Radioactive waste disposed	kg	2,66E-03	1,98E-02	1,12E-04	0,00E+00	-7,29E-02	0,00E+00

Output flow indicators

Results per declared unit (1000 kg of Leno reinforcing mesh)							
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	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
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

Identification of significant issues

The contributions of the modules were assessed based on their contributions to the complete life cycle (all declared modules except D).

At most of the declared parameters the A1 module is the most significant life cycle phase. This includes the production of glass fibre and has a very significant contribution to the impact assessment results because it has the largest share in 7 of the 13 mandatory impact categories and it is significant in almost all categories: GWP-fossil (83,02%), GWP-luluc (84,01%), GWP-total (67,09%), ODP (97,26%), AP (82,79%), EP-marine (83,53%), EP-terrestrial (87,24%), POCP (87,57%), ADP-minerals&metals (99,66%), ADP-fossil (86,68%), WDP (95,09%).

The A2 module, the transportation of the materials by truck, ship and train is significant in category of GWP-luluc (14,51%).

The A3 module is significant in multiple impact categories like GWP-fossil (11,75%), GWP-total (9,49%), AP (13,97%), EP-freshwater (45,7%), EP-marine (6,8%), POCP (5,42%), ADP-fossil (10,68%), WDP (4,98%).

The C1, C2, and C3 modules are not significant in any impact categories.

The C4 module, waste disposal, is in this case the landfilling of the glass fibre end-of-life waste. This is significant in the GWP-biogenic (99,99%), GWP-total (21,27%).

Completeness, consistency and sensitivity checks

The LCA study is complete; there are no relevant life cycle phases or processes excluded. Consistency of the used data is good: high quality specific data have been collected for the A3 module, while the best available generic data have been selected for A1 and for all other life cycle processes.

References

- ISO 14020:2022 Environmental statements and programmes for products — Principles and general requirements
- ISO 14040:2006. Environmental management – Life cycle assessment – Principles and framework. (2006).
- ISO 14044:2006. Environmental management – Life cycle assessment – Requirements and guidelines. ISO. (2006).
- ISO 14025:2006. Labels and environmental declarations
- EN15804:2012+A2:2020. Sustainability in construction. Product environmental statements. Commodity category rules for construction products.
- Product Category Rules (PCR) – Construction Products PCR 2019:14; version 1.3.4
- General Program Instruction (GPI) for the International EPD system; version 5.0
- Updated characterisation and normalisation factors for the Environmental Footprint 3.1 method – JRC report
- Dos Santos Gervasio, H. and Dimova, S., Model for Life Cycle Assessment (LCA) of buildings , EUR 29123 EN, Publications Office of the European Union, 2018, ISBN 978-92-79-79974-7 (print),978-92-79-79973-0 (pdf), doi:10.2760/10016 (online),10.2760/789069 (print), JRC110082.

EPD®

www.environdec.com