Environmental Product Declaration

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

Lagur® Pro

from

Lagur A/S

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	EPD-IES-0017438
Publication date:	2025-01-14
Valid until:	2030-01-13
Type of EPD:	EPD of multiple products, based on a representative product

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
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Accountabilities for PCR, LCA and independent, third-party verification
Product Category Rules (PCR)
CEN standard EN 15804+A2 serves as the Core Product Category Rules (PCR) reference packaging based on EF 3.1.
Product Category Rules (PCR): Construction products 2019:14 Version 1.3.4 ,2024-04-30; EN 50693:2019 Product category rules for life cycle assessments of electronic and electrical products and systems.
PCR review was conducted by: *Martin Erlandsson, IVL Swedish Environmental Research Institute, martin. erlandsson@ivl.se*
Life Cycle Assessment (LCA)
LCA accountability: *Jacob Andreasen, Augustas Sudaras, Green Survey ApS* www.greensurvey.dk
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: *Sigita Židonienė, PhD., Vesta Consulting, Sigita@vestaconsulting.lt* Approved by: The International EPD® System
OR
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+A2, 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+A2 and ISO 14025.

Company information

Owner of the EPD: Lagur A/S
Email: kundeservice@lagur.dk
Phone:+45 70605600
Description of the organisation: The story of LAGUR begins with the Danish engineer and inventor Olav René Nielsen, who developed a new type of water treatment that could eliminate limescale issues without removing the limescale from the water.
LAGUR was founded in 2014 by Olav René Nielsen, Claus Kjær Jensen, and Simon Sørensen, after the three founders had spent four years testing the new water treatment system in various contexts where large amounts of water were used.
The first three water treatment systems were installed at a pig farm, a mink farm, and a hotel.
When the efficiency of the systems was evaluated after six months, the results were unmistakable: At the hotel, cleaning toilets, wet room tiles, and fixtures had become much easier, leaving everything looking fresh and new for the guests. The pig farmer had not cleaned nozzles for six months, and the mink farmer had no issues with limescale or biofilm in the PEX pipes.
Since its inception in 2014, LAGUR has now installed several thousand systems in Danish single-family homes, apartment buildings, businesses, shopping centers, office buildings, and more

Name and location of production site(s): Attrupvej 4, 8550 Ryomgård, Denmark

Product information

Product name: Lagur® Pro
Environmental Product Declaration (EPD): The product composition was determined on the declared unit. The calculations are based on average annual production.
Product description: **LAGUR®** is a simple and effective water treatment solution that is easy to install.
LAGUR® consists of a half-meter-long pipe that is installed after the main water meter and is connected to a control box.
LAGUR® is inexpensive to operate. The **LAGUR® Pro** system uses about 1 kWh per day.
LAGUR® minimizes lime scale problems by changing the structure of the lime, not by breaking it down into smaller parts, because regardless of size, lime particles have a crystalline structure that easily adheres.
LAGUR® converts lime into round granules that minimally adhere to installations and settle as dust on surfaces, where they can be easily removed with a cloth.
LAGUR® first uses electromagnetism to alter the structure of the lime and then ensures that this change is maintained long enough for **LAGUR®** to provide practical benefits to the consumer.
Thus, **LAGUR®** affects the physical state of lime, giving it a more rounded character and causing it to lose its ability to deposit on appliances, fixtures, and surfaces like glass and tiles.

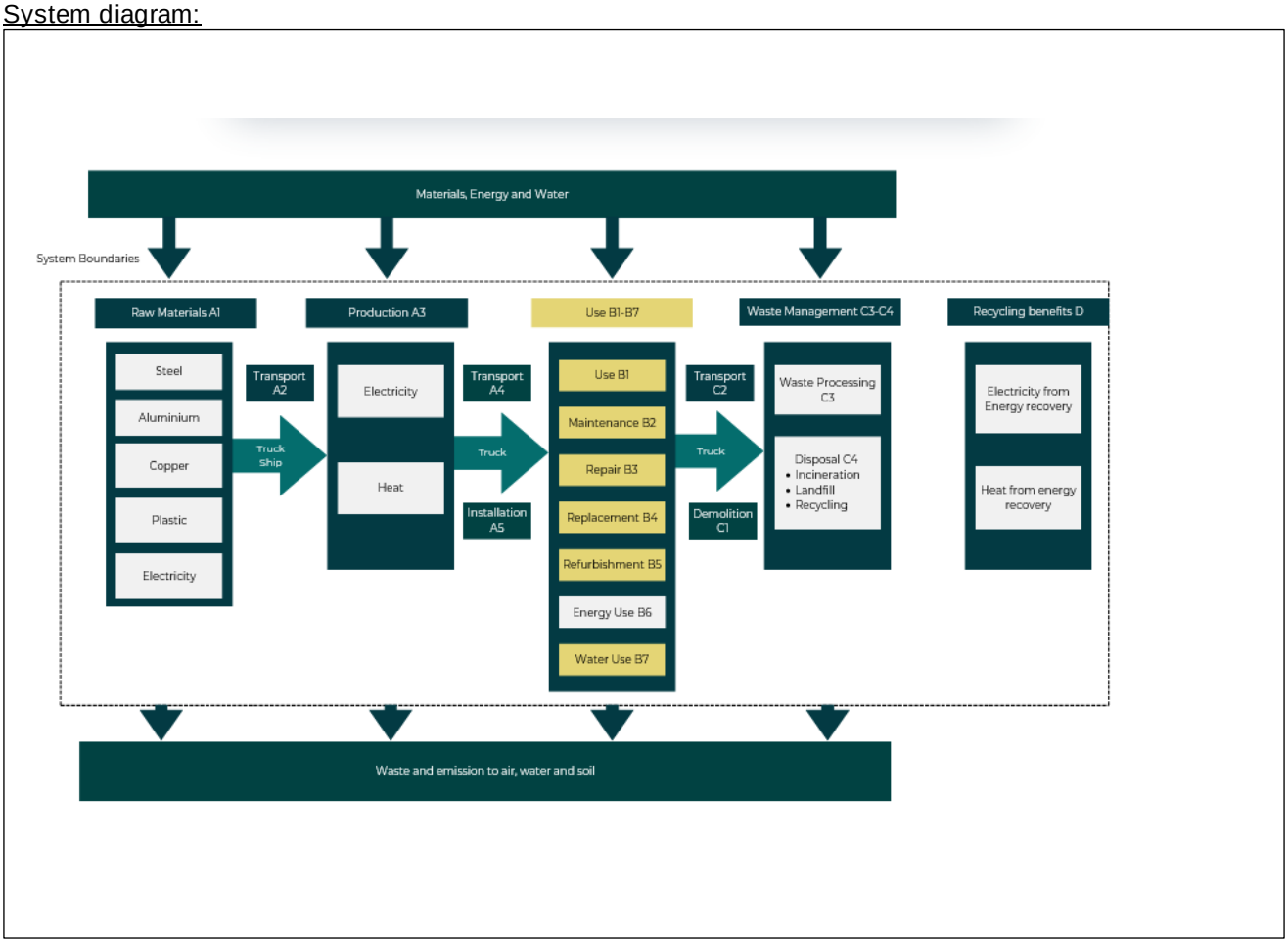
Geographical scope: Europe
UN CPC: 482 - Instruments and appliances for measuring checking, testing, navigating and other purposes, except optical instruments; industrial process control equipment; parts and accessories thereof

LCA information

Declared unit: 1 pcs. There is no standard unit for this type of product, so the results are calculated for one complete product. The Lagur® Pro is made in several different sizes with pipe diameters ranging from 2-10cm. EPD is based on a representative product.

Reference service life: >10 years
Time representativeness: 2023
Database(s) and LCA software used: SimaPro 9.5.0.2 and Ecoinvent 3.9.1 and Ökobaudat 2023-I
Description of system boundaries:
Cradle to gate with options, modules C1-C4 and module D. A1 (Raw material supply), A2 (Transport) and A3 (Manufacturing) A4 (Transportation), A5 (Construction Installation), B6 Operational energy as well as C1 (Deconstruction), C2 (transport at end-of-life), C3 (Waste processing) and C4 (Disposal) in addition, module D – benefits and loads beyond the system boundary is included.

System diagram:



Data quality: The foreground data collected internally is based on yearly production amounts and extrapolations of measurements on specific machines and plants. Overall, the data quality can be described as good. The primary data collection has been done thoroughly.
Cut-off criteria: Life cycle inventory data for a minimum of 99% of total material and energy inputs flows have been included in the life cycle analysis.

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**	**X**	**X**	**MND**	**MND**	**MND**	**MND**	**MND**	**x**	**MND**	**X**	**X**	**X**	**X**	**X**
Geography	EU	EU	DK	EU	DK	-	-	-	-	-	DK	-	DK	GLO	DK	DK	DK
Specific data used	1,9% - primary*			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	<10%**			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	0			-	-	-	-	-	-	-	-	-	-	-	-	-	-
System boundary (X = included in LCA; MND = module not declared)																	

Note: The reported share of primary data is associated with uncertainty, as one or several EPDs that are used as data source lack information on the share of primary data used.

* = Based on GWP-GHG of Stage A3 divided by GWP-GHG for stages A1-A3. Data for A3 is specific to electricity consumed for manufacturing.

** = Since the EPD uses the maximum value of all products, this is based on the percentage difference between the GWP-GHG of the minimum product and the maximum value within the product group.

For the use stage only module B6 was chosen since the products does not require any maintenance, repair or replacements under normal use. When the products are in operation only electricity is used, so only B6 is relevant.

Product stage:
A1: This module considers the extraction and processing of raw materials and energy consumption.
A2: The raw materials are transported to the manufacturing plant. In this case the model includes road and sea transportation for the raw materials.
A3: This module encompasses the manufacturing process of Lagur® Pro, including product fabrication and packaging. It accounts for energy use and waste generation at the production facility. Key steps include:

- **Milling of steel end caps**

Purpose built end caps are made, so the product can be attached to existing pipes in homes/businesses. This process generates some waste.

- **Winding of copper spools**

The electromagnetic signals are generated with spools of copper wire (electromagnets). Copper wire is spun around the inner steel tube of the product.

- **Sandblasting of outer steel tube**

The outer steel tube is sandblasted to achieve the desired look of the final product.

- **Electronics assembly**

The product includes a control box with electronics which ensures the product' functionality.

- **Powder coating for control box**

In the Pro version of the Lagur® product, the control box is made of aluminium. The aluminium receives powder coating to achieve rust resistance and the desired aesthetics.
A4: Transportation to the customer was estimate that on average is 150km.
A5: Installation of the Lagur® Pro
The installation process for Lagur® Pro can be completed without the need for power tools, as it primarily involves attaching the parts with screws. Additionally, the foam and cardboard packaging is thrown out as waste in this phase. It is assumed that 98% of the packaging waste is incinerated.
B6: When the Lagur® Pro system is installed it has a constant power draw of 40 watts, for the entire lifetime of the product which is 10 years. Emissions are based on the Danish electricity mix.

End of Life stage:
C1: Dismantling of the product can be done without any power tools, therefore there are no inputs on the C1 phase.
C2. Transport of the discarded product to the processing site. It is estimated that there is no mass loss during the use of the product, therefore, the end-of-life product is assumed that it has the same weight as the declared product. All end-of-life products are being transported to waste treatment and processing which according to the Danish waste management infrastructure on average is assumed to be 20 km distance and the transportation method is lorry which is the most common.
C3: Waste treatment – recycling of the steel, copper and aluminium materials is assumed to be 95%. The control box is designed to be disassembled for recycling, facilitating the separation of its components. The printed circuit board (PCB) and cable fall under the category of electrical and electronic equipment (EEE), and their end-of-life treatment follows the requirements outlined in **EN 50693:2019**.
C4: Waste treatment – Inert waste from recycling processes of metal, plastic and electronic components, are assumed to be landfilled.
D: Reuse, recovery and/or recycling potential. The benefits of the recycling of the metals as avoiding of producing the new raw materials.

Content information

Product components	Weight, kg	Percentage of the product composition - %	Post-consumer material, weight-%	Biogenic material, weight-% and kg C/kg
Steel inner pipe	6,9	35,98%	0	0
Steel outer pipe	4,0	21,06%	0	0
Steel end caps	3,9	20,46%	0	0
Plastic rings	0,2	1,17%	0	0
Copper	2,9	15,12%	0	0
Control box	0,782	4,08%	0	0
Electronics	0,368	1,92%	0	0
TOTAL	**19,13**	**100%**	**0**	**0**
Packaging materials	**Weight, kg**	**Percentage of the packaging composition - %**	**Weight-% (versus the product)**	**Weight biogenic carbon, kg C/kg**
Cardboard	1,14	62,35%	5,9%	0,47
Foam	0,69	37,65%	3,6%	0

No dangerous substances from the candidate list of SVHC for Authorisation are present in concentrations greater than 0.1% by weight in the product.

Results of the environmental performance indicators

Mandatory impact category indicators according to EN 15804+A2

Results per Declared Unit										
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-fossil	kg CO_2 eq.	1,69E+02	1,60E+00	2,07E+00	7,61E+02	0,00E+00	8,86E-02	2,90E-01	6,78E-01	-1,22E+02
GWP-biogenic	kg CO_2 eq.	4,73E-01	1,41E-03	1,81E+00	5,10E+01	0,00E+00	8,12E-05	6,03E-03	2,33E-05	-1,04E+00
GWP-luluc	kg CO_2 eq.	2,30E-01	9,36E-04	2,28E-05	2,37E+00	0,00E+00	4,37E-05	1,75E-04	9,70E-06	-1,49E-01
GWP-total	kg CO_2 eq.	1,70E+02	1,60E+00	3,88E+00	8,14E+02	0,00E+00	8,87E-02	2,97E-01	6,79E-01	-1,23E+02
ODP	kg CFC 11 eq.	4,11E-06	3,48E-08	2,27E-09	1,74E-05	0,00E+00	1,93E-09	5,79E-09	5,44E-10	-3,51E-06
AP	mol H^+ eq.	2,70E+00	3,40E-03	6,28E-04	3,83E+00	0,00E+00	1,94E-04	1,44E-03	1,82E-04	-1,06E+00
EP-freshwater	kg P eq.	2,26E-01	1,35E-04	7,92E-06	6,54E-01	0,00E+00	6,30E-06	3,74E-05	1,93E-06	-9,35E-02
EP-marine	kg N eq.	2,36E-01	7,91E-04	3,60E-04	7,56E-01	0,00E+00	4,89E-05	5,31E-04	8,26E-05	-1,48E-01
EP-terrestrial	mol N eq.	2,86E+00	8,00E-03	2,99E-03	8,69E+00	0,00E+00	4,96E-04	5,68E-03	8,43E-04	-1,59E+00
POCP	kg NMVOC eq.	7,87E-01	5,02E-03	7,88E-04	2,11E+00	0,00E+00	3,01E-04	1,94E-03	2,49E-04	-4,98E-01
ADP-minerals&metals*	kg Sb eq.	5,06E-02	6,97E-06	1,45E-07	1,71E-02	0,00E+00	2,90E-07	5,56E-07	3,42E-08	-1,74E-02
ADP-fossil*	MJ	2,18E+03	2,25E+01	6,11E-01	1,25E+04	0,00E+00	1,26E+00	4,34E+00	3,79E-01	-1,45E+03
WDP*	m^3	5,06E+01	9,30E-02	4,30E-02	1,42E+02	0,00E+00	5,19E-03	1,23E-01	1,42E-02	-2,51E+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.*

Note: it is discouraged to use the results of modules A1-A3 without considering the results of module C when module C is declared.

Disclaimer: 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.

Additional mandatory and voluntary impact category indicators

Results per Declared Unit										
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-GHG[1]	kg CO_2 eq.	1,70E+02	1,60E+00	2,10E+00	7,71E+02	0,00E+00	8,87E-02	2,91E-01	6,79E-01	-1,23E+02

*This method is based on the final government distribution version of the IPCC report 'AR6 Climate Change 2021.This version of the method excludes CO2 uptake and biogenic CO2 emissions.

Resource use indicators

Results per Declared Unit										
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	5,24E+01	1,22E-01	5,62E-03	3,73E+03	0,00E+00	4,87E-03	2,27E-02	1,32E-03	-4,68E+01
PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	5,24E+01	1,22E-01	5,62E-03	3,73E+03	0,00E+00	4,87E-03	2,27E-02	1,32E-03	-4,68E+01
PENRE	MJ	2,14E+03	2,25E+01	2,89E+01	1,25E+04	0,00E+00	1,26E+00	4,34E+00	9,70E+00	-1,45E+03
PENRM	MJ	3,76E+01	0,00E+00	-2,83E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-9,32E+00	0,00E+00
PENRT	MJ	2,18E+03	2,25E+01	6,11E-01	1,25E+04	0,00E+00	1,26E+00	4,34E+00	3,79E-01	-1,45E+03
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	1,78E+01
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m^3	1,51E+01	3,67E-03	1,54E-03	2,36E+01	0,00E+00	1,81E-04	3,46E-03	3,75E-04	-1,26E+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									

[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.

Waste indicators

Results per Declared Unit										
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	1,02E-01	5,74E-04	2,50E-02	1,63E+00	0,00E+00	3,15E-05	3,06E+00	4,92E-03	-5,49E-02
Non-hazardous waste disposed	kg	3,16E+01	7,16E-01	9,01E-02	1,01E+02	0,00E+00	6,25E-02	1,43E+01	1,97E+00	-7,92E+01
Radioactive waste disposed	kg	2,75E-02	1,11E-05	2,55E-07	6,48E-02	0,00E+00	4,14E-07	1,71E-06	6,84E-08	-3,04E-03

Output flow indicators

Results per Declared Unit										
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B6**	**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	3,06E-01	0,00E+00	-3,06E-01
Material for recycling	kg	6,48E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,72E+01	0,00E+00	-1,76E+01
Materials for energy recovery	kg	4,02E-01	0,00E+00	1,82E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-2,39E-01
Exported energy, electricity	MJ	2,77E+00	0,00E+00	7,45E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-1,36E-01
Exported energy, thermal	MJ	4,98E+00	0,00E+00	1,34E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-2,44E+00

Information on biogenic carbon content

BIOGENIC CARBON CONTENT PER DECLARED UNIT		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in product	[kg C]	0
Biogenic carbon centent in accompanying packagaing	[kg C]	0,47
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO_2	

Additional environmental information

Table showing end-of-life scenario

Scenario information	Value	Unit
Assumptions for scenario development	-	As appropriate
Collected separately	19,13	kg
Collected with mixed waste:	-	kg
For reuse	0,306	kg
For recycling	17,656	kg
For energy recovery	-	kg
For final disposal:	1,164	kg

Manufacturing energy scenario documentation

Energy Source	Method	Kg CO2eq/kWh
Danish electric mix	IPCC 2021	0.211

References

General Programme Instructions of the International EPD® System. Version 4.0.
ISO 14025:2010 Environmental labels and declarations – Type III environmental declarations Principles and procedures.
ISO 14040:2006 Environmental management. Life cycle assessment. Principles and frameworks.
ISO 14044:2006 Environmental management. Life cycle assessment. Requirements and guidelines. EN 15804+A2 Sustainability in construction works – Environmental product declarations – Core rules for the product category of construction products.
EN 50693:2019 Product category rules for life cycle assessments of electronic and electrical products and systems
PCR 2019:14 Construction products (version 1.3.4) date: 2024-04-30
Background REPORT: Lagur® Pro & Home, December 2024
Software: Simapro 9.5.0.2
Databases: Ecoinvent version 3.9.1, ÖKOBAUDAT. (2023)

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