Environmental Product Declaration

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

LIP Primers

***from* LIP Bygningsartikler A/S**

Programme:	The International EPD® System, www.environdec.com
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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

Owner of the declaration and manufacturer:
LIP Bygningsartikler A/S · Industrivej 16 · DK-5580 Nørre Aaby · Phone: +45 6442 1330 · Fax: +45 6442 3408

Declaration issued: 2021-11-02

EPD Prepared by: Bureau Veritas HSE, Denmark

Standards: ISO 14025 and EN 15804+A2:2019. EPD's of other construction products may not be comparable if they do not comply with this standard.

Statement: This report records that the LCA based information and the additional information declared in the EPD meets the requirements of the European Standard EN 15804:2010+A2:2019 and PCR 2019:14 v 1.11.

Scope: This LCA study is intended to be used in a cradle to grave with module D EPD covering the following primers in table 1, all produced by LIP Bygningsartikler A/S at the same production site. The EPD will be accessible on http://www.lip.dk/ together with safety data sheets and product information, providing information for business-to-business communication. The Geographical scope is Europe.

About LIP Bygningsartikler A/S

LIP Bygningsartikler A/S is a Danish Company, which since its founding in 1967 has produced high quality products at competitive prices.

The product range from the beginning was tile adhesive and sealants, which since then has been expanded with products within flooring putty, waterproofing, silicone, epoxy, filler compounds, etc.

All our products are continuously under internal as well as external quality control, so that we can always live up to our slogan:

LIP - when building on quality!

Product information

Products represented

LIP 2K Waterproofing adhesive, LIP vS 30 Waterproofing adhesive, LIP 54 Primer & LIP Supergrund.

Figure 1: Pictures of the four LIP products covered in this project report.

Product description

These products are manufactured by LIP Bygningsartikler A/S in the production plants located in Nørre Aaby, Denmark. LIP 2K Waterproofing Adhesive is used for making up waterproofing paste for waterproofing floors and walls in damp rooms before covering the walls and floors with ceramic tiles or natural stones.
LIP VS 30 Waterproofing Membrane is a liquid which is used for waterproofing floors and walls in damp rooms before covering floors and walls with ceramic tiles or natural stones.
The Primer 54 and LIP Supergrund are liquids which are used for priming substrates before applying LIP floor compounds.
The manufacturing process starts from raw materials purchased from suppliers and stored in the plant. Bulk raw materials are stored in specific silos and added mostly automatically in the production mixer, according to the formula of the product. Other raw materials, supplied in bags or big bags, are stored in their warehouse and added automatically or manually in the mixer. The production is a discontinuous process, in which all the components are mechanically mixed in batches.
The semi-finished product is then packaged in plastic cans and film, put on wooden pallets, covered by stretched hoods and stored in the Finished Products' warehouse. The quality of final products is controlled before the sale.

The product is supplied from production in dry form, premixed in respect of all contents but water. Water is added for Lip 54 Primer and LIP Supergrund at the building site in the construction/ installation stage, in a defined amount and technique, in order to produce a deformable cementitious adhesive of high performance.

Table 1: Product ingormation for the four products covered by this EPD.

Product name		Article no.	Description
Danish	English		
LIP 2K Vandtætningsbinder	LIP 2K Waterproofing adhesive	5 kg: 4019659 2 kg: 4019642	2 and 5 kg plastic buckets
LIP VS 30 Vandtætningsmembran	LIP vS 30 Waterproofing adhesive	12 kg: 80049 3 kg: 80032	3 and 12 kg plastic buckets

Lip 54 Primer	LIP 54 Primer	10 litres: 3856614 2,5 litres: 3856606 1 litre: 90543	1, 2,5 and 10 litre containers
LIP Supergrund	LIP Supergrund	12 kg: 80506 3 kg: 80513 1 kg: 80520	1, 3 and 12 kg buckets

Declared Unit

The declared unit (DU) is 1 kg of dry-packed finished product. This EPD describes the environmental impact of 1 kg of dry-packed primer. The product consumption, of course, depends on the size of the tile, unevenness, grout size and the size of the tools.

Reference service life

According to LIP Bygningsartikler A/S experience, the Reference Service Life (RSL) of premade mortars is not applicable, as B1-B7 modules are not declared and not assessed. The product does not need maintenance or replacement during its service life, if professionally used and properly installed.

Technical data

The LIP 2K Waterproofing and LIP vS 30 Waterproofing adhesive products are designed, produced and classified in table 2 according to Guideline for European Technical Approval (ETAG) No. 022 Watertight covering kits for wet room floor and/or walls, Part 1 Liquid applied coverings with or without wearing surface. LIP 54 Primer and LIP Supergrund are not CE marked.

Table 2: Performance information for the four products according to EN 12004:2007+A1:2012.

	LIP 2K Waterproofing	**LIP vS 30 Waterproofing adhesive**	**Lip 54 Primer**	**LIP Supergrund**
	ETAG 022	ETAG 022	N/A	N/A
Bond's tearing strength	≥ 0.5 MPa	≥ 0.5 MPa	N/A	N/A
Joint bridging ability	≥ 0.5 MPa	≥ 0.5 MPa	N/A	N/A
Water tightness around penetrations	≥ 0.5 MPa	≥ 0.5 MPa	N/A	N/A
Resistance to temperature	≥ 0.5 MPa	≥ 0.5 MPa	N/A	N/A
Resistance to water	≥ 0.5 MPa	≥ 0.5 MPa	N/A	N/A

Air emission

All the four Primers covered in this EPD has low dust technology and very low emission of volatile organic compounds and documented with GEV-EMICODE EC 1^{PLUS}. Documentation for GEV-EMICODE can be found on lip.dk and can be also provided upon request.

Content declaration

Content declaration including packaging covering the four LIP Primers in this EPD.

Table 3: Content declaration, which covers the four LIP products.

LIP Primers			
Product components	**Weight%**	**Post-consumer material, weight-%**	**Renewable material, weight-%**
Silica sand	0 - 20	0%	0%
Calcium carbonate	0 - 45	0%	0%
Water	0 - 30	0%	0%
Polymer	30 -98	0%	0%
Additives	1-20	0%	0%
Packaging materials	**Weight, kg**	**Weight-% (versus the product)**	
Jerry cans Plastic	26 – 72 g/kg product	2.6 - 7.2 %	
Bucket Metal	0 - 7.6 g/kg product	0 - 0.76 %	
Transport packaging PE-film	0.6 g/kg product	0.06 %	
Total:		<8.2%	

During the life cycle of the product no hazardous substance listed in the "Candidate List of Substances of Very High Concern (SVHC) for authorization" has been used in a percentage higher than 0.1% of the weight of the product.

LCA information

Product category rules (PCR)

PCR 2019:14 Construction products (EN 15804:A2) Version 1.11.

Time representativeness

Data from factory (primary data) is from 2021.

Database(s) and LCA software used

LCA Software: Simapro 9.3

Database: Most processes in the LCA Software have been modelled using the EcoInvent database 3.8. The database was available in SimaPro as local LCI process libraries, allowing for background data integration. Instead of using generic data for the main components including cement, calcium carbonate and polymer powder, the suppliers of those raw materials were contacted and specific EPD for their raw materials were used.

EPDs used as input data along with their EPD related information i.e. EPD program, validity dates, owner, etc. are presented 'Database section' of the LCA project report, in order to preserve confidentiality of the supplier.

The impact models used are the ones included in the Simapro method named EN 15804 +A2 Method V1.00 / EF 3.0 normalization and weighting set.

Cut-off criteria for initial inclusion of inputs and outputs

The general rules for cut-off of inputs and outputs follow the requirements in EN 15804, 6.3.5, where the total of neglected input flows per module shall be a maximum of 5 % of energy usage and mass and 1 % of

energy usage and mass for unit processes. Recycling processes and benefits for recycled plastic packaging is regarded as below cut-off criterion of 1%.

Allocation principles and procedures

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation. In this study, as per EN 15804, allocation is conducted in the following order.

1. Allocation should be avoided.
2. Allocation should be based on physical properties (e.g. mass, volume) when the difference in revenue is small.
3. Allocation should be based on economic values.

The "Allocation, cut-off by classification" system model that has been chosen subdivides multi-product activities by allocation, based on physical, economic, mass or other properties. By-products of waste treatment processes are cut-off, as are all by-products classified as recyclable. Markets in this model include all activities in proportion to their current production volume.

The production energy used in this LCA study, is derived by the total energy consumption at the location of LIP Bygningsartikler A/S divided by the total production volume of all their products. However, there are no co-products, and therefore no allocation between products beside the energy.

Description of system boundaries

This study covers a cradle-to-gate with options (A1-A5, C1-C4 and D) EPD.

Table 4: Life cycle stages covered by this LCA study.

	Product stage			**Installation processes**		**Use stage**							**End of life 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-A3			A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D

	Production of commodities, raw materials	Product manufacture														
Modules declared	X		X	X	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	Europe	Denmark	Europe													
Process type	Upstream	Processes the manufacture has influence over	Downstream													
Data type	>58 % share of specific data in % GWP-GHG	Specific	-													
Variation – products	Not relevant		-													
Variation – sites	Manufactured in one site		-													

Product stage (A1-A3):

- A1-A2: extraction, supply and transport of raw materials and packaging to LIP Bygningsartikler A/S. Raw materials are purchased from European suppliers.
- A3: manufacturing process of product and its packaging and waste management from the same process. All the electricity comes from wind energy produced at Lindø Port with >3MW onshore wind turbines. Approximately 0.88MJ is used for the production of 1 kg product. A3 covers dosage and mixing of selected and measured raw materials and additives to ensure that the product meets desired properties and packaging material consumption. Packaging product materials consist of the bag material, wooden pallet and LDPE used as wrapping material. A calculation has been already made that the wooden pallet can hold at least 48 bags of product and it was used to calculate how much wrapping foil is needed.
  Therefore, presuming 25 use cycles is reasonable for one pallet, in average 1/25 of the manufacturing and waste handling of one pallet should be allocated to at least the 48 bags of product(s) transported in one pallet use cycle or 1/48 for 1 bag of product. Therefore, the waste from the same process is assessed to be negligible, as raw material waste, if any, will be used in subsequent process or directed to incineration.

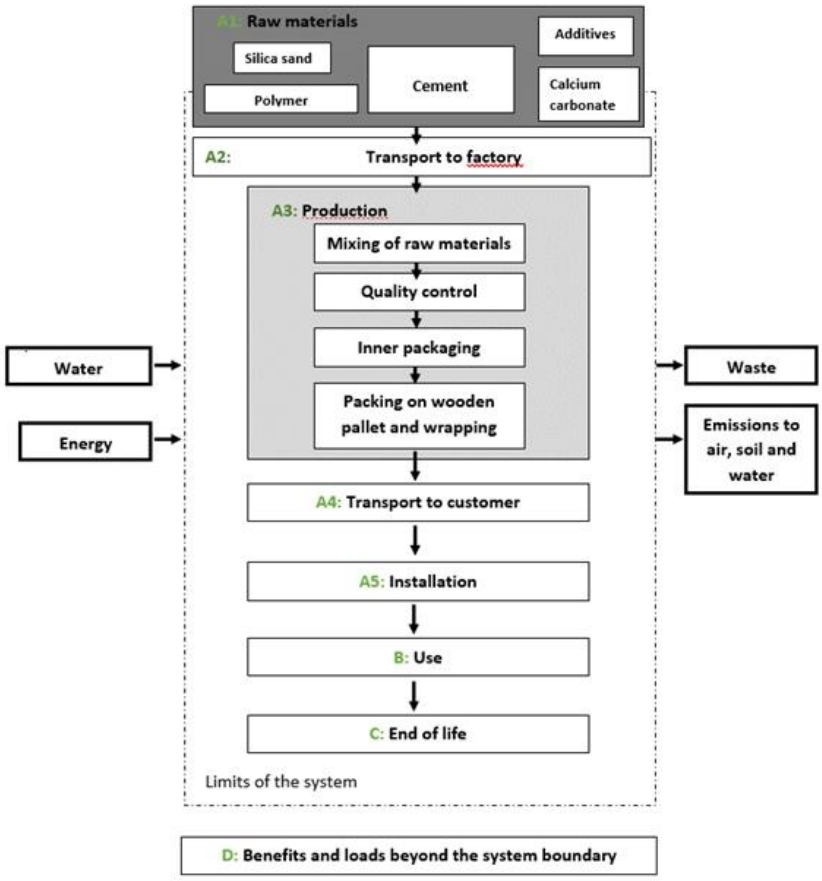

Figure 2: Limits of the system in this study.

Construction process stage (A4-A5):

- A4: distribution to typical customer by transport of packaged product from production gate to end user (building site). The customers of LIP Bygningsartikler A/S are primarily from Denmark. About 92 percent of the products produced by LIP at the production site in Nørre Aaby in Denmark, are sold in Denmark, 4 percent in Sweden, 2 percent in Norway and 1 percent in both Germany and the Netherlands. The distance has in the present LCA study been estimated to be 500km via road transport by a Euro 6 lorry of 32 metric ton.
- A5: installation of product into building, including required water and its blending energy. For installation, water consumption can be found in table 1. Mixing electricity consumption is assumed to be 0.216 MJ/kg. This is equivalent to the use of a 1200-Watt handheld mixer for 3 minutes. It is estimated that if the technician has experience and uses the same bucket of tile mortar product to reduce residue, 2-4 % could be expected. This estimate is expressed in the model by 5% loss instead, as a conservative approach. 5% loss has been advised to LIPs customers and LIP offers calculator with losses on LIPs website as a guide when buying products. No industry standard exists and PCR does not provide further guidance for any losses or spillage. The product can be used in 12 months or 18 months. The electricity mix is modelled with European mix and it is considered as an adequate choice, but since more than 90% of the market is in Denmark, Danish residual mix would be a better choice to consider in this study's validity period of 5 years.

Use stage (B1-B7):

- B1 to B7 are not declared (ND) as they are not applicable: the product does not need maintenance or replacement during its service life, if professionally used and properly installed.

End of life stage (C1-C4):

- C1: deconstruction and demolition of the product into the building. Primers for surface use are typically not considered as part of the structure of the building. However, during the building destruction, the quantity of extra energy required to break this application can be neglected compared to the energy required to demolish the structure of the building and are therefore not included in this LCA study.
- C2: transport of waste product from demolition to recycling/disposal facility that is waste collection. The distance covered is 50 km via road transport by a Euro 6 lorry of 32 metric ton.
- C3: The product is expected to be disposed in landfill after end of life, so waste processing is negligible.
- C4: Waste disposal including physical pre-treatment.

D Reuse-Recovery-Recycling potential

Module D calculates the potential environmental benefits of the recycling or reuse of materials. This product has not considerable benefits due to recycling or/and reuse.

Environmental performance

All the environmental impacts have been calculated in SimaPro and with the EN 15804 + A2 Method, which takes all the methods defined by the European Standard EN 15804 + A2 into account.

All the LCIA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks.

The disclaimers can be found on ‘Programme-related information and verification’ section on page 18 of this EPD report.

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

Core environmental impact indicators

Table 5: Core environmental impact results for the product LIP 2K Waterproofing adhesive

Results per declared unit									
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
GWP- total	kg CO_2 eq.	2,28E+00	4,35E-02	2,73E-01	0	4,35E-03	0	5,28E-03	0
GWP-fossil	kg CO_2 eq.	2,31E+00	4,35E-02	1,32E-01	0	4,35E-03	0	5,27E-03	0
GWP-biogenic	kg CO_2 eq.	-3,52E-02	-8,99E-06	1,40E-01	0	4,62E-06	0	5,72E-06	0
GWP- luluc	kg CO_2 eq.	2,13E-03	1,65E-05	1,32E-04	0	1,63E-06	0	4,97E-06	0
ODP	kg CFC 11 eq.	2,38E-07	1,09E-08	1,28E-08	0	1,08E-09	0	2,13E-09	0
AP	mol H^+ eq.	3,36E-02	1,39E-04	1,77E-03	0	1,39E-05	0	4,95E-05	0
EP-freshwater	kg P- eq.	9,63E-04	2,91E-06	5,93E-05	0	2,83E-07	0	4,82E-07	0
EP- marine	kg N eq.	2,53E-03	3,11E-05	1,85E-04	0	3,10E-06	0	1,72E-05	0
EP-terrestrial	mol N eq.	2,38E-02	3,40E-04	1,35E-03	0	3,39E-05	0	1,88E-04	0
POCP	kg NMVOC eq.	9,27E-03	1,34E-04	5,26E-04	0	1,33E-05	0	5,48E-05	0
ADP-minerals&metals**	kg Sb eq.	3,56E-05	1,04E-07	1,90E-06	0	1,04E-08	0	1,20E-08	0
ADP-fossil**	MJ	4,09E+01	7,08E-01	2,35E+00	0	7,08E-02	0	1,47E-01	0
WDP **	m^3	2,56E+00	2,46E-03	1,32E-01	0	2,43E-04	0	6,62E-03	0
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								

Additional environmental impact indicators

Table 6: Additional environmental impact results for the product LIP 2K Waterproofing adhesive

Results per declared unit									
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-GHG	kg CO_2 eq.	2,26E+00	4,32E-02	1,81E-01	0	4,39E-03	0	5,37E-03	0
PM	disease inc.	9,27E-03	1,34E-04	5,26E-04	0	1,33E-05	0	5,48E-05	0
IRP*	kBq U235 eq	2,38E-07	1,09E-08	1,28E-08	0	1,08E-09	0	2,13E-09	0
ETP-fw**	CTUe	2,38E-02	3,40E-04	1,35E-03	0	3,39E-05	0	1,88E-04	0
HTP-c**	CTUh	3,20E-08	4,70E-10	1,95E-09	0	4,69E-11	0	2,55E-11	0
HTP-nc**	CTUh	2,13E-03	1,65E-05	1,32E-04	0	1,63E-06	0	4,97E-06	0
SQP**	Dimensionless	6,36E+01	5,53E-01	3,57E+00	0	5,53E-02	0	9,29E-02	0
Acronyms	GWP-GHG: The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus equal to the GWP indicator originally defined in EN 15804:2012+A1:2013. PM = Particulate Matter emissions; IRP = Ionizing radiation, human health; ETP-fw = Eco-toxicity, freshwater; HTP-c = Human toxicity, cancer effects; HTP-nc = Human toxicity, non-cancer effects; SQP = Land use related impacts/Soil quality.								

Use of resources

Table 7: Resource use - LIP 2K Waterproofing adhesive

Results per declared unit									
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	4,35E+00	1,13E-02	2,13E-01	0	9,00E-04	0	1,25E-03	0
PERM	MJ	1,07E+00	0	0	0	0	0	0	0
PERT	MJ	5,42E+00	1,13E-02	2,13E-01	0	9,00E-04	0	1,25E-03	0
PENRE	MJ	1,89E+01	7,52E-01	2,51E+00	0	7,52E-02	0	1,56E-01	0
PENRM	MJ	2,47E+01	0	0	0	0	0	0	0
PENRT	MJ	4,37E+01	7,52E-01	2,51E+00	0	7,52E-02	0	1,56E-01	0
SM	kg	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0
FW	m3	2,47E+00	2,47E-03	1,28E-01	0	2,45E-04	0	6,63E-03	0
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 production

At end of use, when the hardened product is demolished, the LIP Primers are non-hazardous building waste. The waste from packing material are also assumed to be non-hazardous waste.

Table 8: Waste - LIP 2K Waterproofing adhesive

Results per declared unit									
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	0	0	0	0	0	0	0	0
Non-hazardous waste disposed	kg	0	0	0	0	0	0	0	0
Radioactive waste disposed	kg	0	0	0	0	0	0	0	0

Output flows

Table 9: Output flows - LIP 2K Waterproofing adhesive

Results per declared unit									
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
Components for re-use	kg	0	0	0	0	0	0	0	0
Material for recycling	kg	0	0	7.16E-02	0	0	0	0	0
Materials for energy recovery	kg	0	0	0	0	0	0	0	0
Exported energy, electricity	MJ	0	0	0	0	0	0	0	0
Exported energy, thermal	MJ	0	0	0	0	0	0	0	0

Information on biogenic carbon content

Table 10: Biogenic Carbon - LIP 2K Waterproofing adhesive

	Unit	**Quantity**
Biogenic carbon content in product	kg C	0
Biogenic carbon content in packaging	kg C	3,34E-02
Results per functional or declared unit. Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO2.		

LIP vS 30 Waterproofing adhesive

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

Core environmental impact indicators

Table 11: Core environmental impact results for the product LIP vS 30 Waterproofing adhesive

Results per declared unit									
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
GWP- total	kg CO_2 eq.	1,34E+00	4,35E-02	1,56E-01	0	4,35E-03	0	5,28E-03	0
GWP-fossil	kg CO_2 eq.	1,37E+00	4,35E-02	8,23E-02	0	4,35E-03	0	5,27E-03	0
GWP-biogenic	kg CO_2 eq.	-2,65E-02	1,72E-05	7,35E-02	0	4,62E-06	0	5,72E-06	0
GWP- luluc	kg CO_2 eq.	7,85E-04	1,64E-05	6,84E-05	0	1,63E-06	0	4,97E-06	0
ODP	kg CFC 11 eq.	7,48E-08	1,08E-08	4,00E-09	0	1,08E-09	0	2,13E-09	0
AP	mol H^+ eq.	5,89E-03	1,39E-04	3,76E-04	0	1,39E-05	0	4,95E-05	0
EP-freshwater	kg P- eq.	2,55E-04	2,87E-06	2,55E-05	0	2,83E-07	0	4,82E-07	0
EP- marine	kg N eq.	1,05E-03	3,11E-05	8,84E-05	0	3,10E-06	0	1,72E-05	0
EP-terrestrial	mol N eq.	1,09E-02	3,39E-04	6,70E-04	0	3,39E-05	0	1,88E-04	0
POCP	kg NMVOC eq.	4,54E-03	1,34E-04	2,69E-04	0	1,33E-05	0	5,48E-05	0
ADP-minerals&metals**	kg Sb eq.	1,11E-05	1,04E-07	6,78E-07	0	1,04E-08	0	1,20E-08	0
ADP-fossil**	MJ	4,18E+01	7,08E-01	2,37E+00	0	7,08E-02	0	1,47E-01	0
WDP **	m^3	8,96E-01	2,45E-03	4,86E-02	0	2,43E-04	0	6,62E-03	0
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								

Additional environmental impact indicators

Table 12: Additional environmental impact results for the product LIP vS 30 Waterproofing adhesive

Results per declared unit									
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-GHG	kg CO_2 eq.	1,32E+00	4,32E-02	1,07E-01	0	4,32E-03	0	5,18E-03	0
PM	disease inc.	4,54E-03	1,34E-04	2,69E-04	0	1,33E-05	0	5,48E-05	0
IRP*	kBq U235 eq	7,48E-08	1,08E-08	4,00E-09	0	1,08E-09	0	2,13E-09	0
ETP-fw**	CTUe	1,09E-02	3,39E-04	6,70E-04	0	3,39E-05	0	1,88E-04	0
HTP-c**	CTUh	8,50E-09	4,70E-10	6,67E-10	0	4,69E-11	0	2,55E-11	0
HTP-nc**	CTUh	7,85E-04	1,64E-05	6,84E-05	0	1,63E-06	0	4,97E-06	0
SQP**	Dimensionless	1,30E+01	5,53E-01	9,22E-01	0	5,53E-02	0	9,29E-02	0
Acronyms	GWP-GHG: The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus equal to the GWP indicator originally defined in EN 15804:2012+A1:2013. PM = Particulate Matter emissions; IRP = Ionizing radiation, human health; ETP-fw = Eco-toxicity, freshwater; HTP-c = Human toxicity, cancer effects; HTP-nc = Human toxicity, non-cancer effects; SQP = Land use related impacts/Soil quality.								

Use of resources

Table 13: Resource use - LIP vS 30 Waterproofing adhesive

Results per declared unit									
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	1,66E+00	1,02E-02	1,08E-01	0	9,00E-04	0	1,25E-03	0
PERM	MJ	5,60E-01	0	0	0	0	0	0	0
PERT	MJ	2,22E+00	1,02E-02	1,08E-01	0	9,00E-04	0	1,25E-03	0
PENRE	MJ	2,66E+01	7,52E-01	2,53E+00	0	7,52E-02	0	1,56E-01	0
PENRM	MJ	1,82E+01	0	0	0	0	0	0	0
PENRT	MJ	4,49E+01	7,52E-01	2,53E+00	0	7,52E-02	0	1,56E-01	0
SM	kg	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0
FW	m3	8,64E-01	2,46E-03	4,69E-02	0	2,45E-04	0	6,63E-03	0
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 production

At end of use, when the hardened product is demolished, the LIP Primers are non-hazardous building waste. The waste from packing material is also assumed to be non-hazardous waste.

Table 14: Waste - LIP vS 30 Waterproofing adhesive

Results per declared unit									
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	2,12E-09	0	1,06E-10	0	0	0	0	0
Non-hazardous waste disposed	kg	1,04E-04	0	5,20E-06	0	0	0	0	0
Radioactive waste disposed	kg	1,99E-05	0	9,96E-07	0	0	0	0	0

Output flows

Table 15: Output flows - LIP vS 30 Waterproofing adhesive

Results per declared unit									
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
Components for re-use	kg	0	0	0	0	0	0	0	0
Material for recycling	kg	0	0	3.68E-02	0	0	0	0	0
Materials for energy recovery	kg	0	0	0	0	0	0	0	0
Exported energy, electricity	MJ	0	0	0	0	0	0	0	0
Exported energy, thermal	MJ	0	0	0	0	0	0	0	0

Information on biogenic carbon content

Table 16: Biogenic Carbon - LIP vS 30 Waterproofing adhesive

	Unit	**Quantity**
Biogenic carbon content in product	kg C	0
Biogenic carbon content in packaging	kg C	1,75E-02
Results per functional or declared unit. Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO2.		

LIP 54 Primer

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

Core environmental impact indicators

Table 17: Core environmental impact results for the product LIP 54 Primer

Results per declared unit									
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
GWP- total	kg CO_2 eq.	1,62E+00	4,35E-02	1,77E-01	0	4,35E-03	0	5,28E-03	0
GWP-fossil	kg CO_2 eq.	1,65E+00	4,35E-02	9,87E-02	0	4,35E-03	0	5,27E-03	0
GWP-biogenic	kg CO_2 eq.	-2,74E-02	1,53E-05	7,84E-02	0	4,62E-06	0	5,72E-06	0
GWP- luluc	kg CO_2 eq.	8,99E-04	1,64E-05	7,46E-05	0	1,63E-06	0	4,97E-06	0
ODP	kg CFC 11 eq.	7,89E-08	1,08E-08	4,75E-09	0	1,08E-09	0	2,13E-09	0
AP	mol H^+ eq.	6,34E-03	1,39E-04	4,05E-04	0	1,39E-05	0	4,95E-05	0
EP-freshwater	kg P- eq.	3,06E-04	2,87E-06	2,81E-05	0	2,83E-07	0	4,82E-07	0
EP- marine	kg N eq.	1,25E-03	3,11E-05	1,01E-04	0	3,10E-06	0	1,72E-05	0
EP-terrestrial	mol N eq.	1,29E-02	3,39E-04	7,87E-04	0	3,39E-05	0	1,88E-04	0
POCP	kg NMVOC eq.	5,37E-03	1,34E-04	3,18E-04	0	1,33E-05	0	5,48E-05	0
ADP-minerals&metals**	kg Sb eq.	1,40E-05	1,04E-07	8,29E-07	0	1,04E-08	0	1,20E-08	0
ADP-fossil**	MJ	5,23E+01	7,08E-01	2,93E+00	0	7,08E-02	0	1,47E-01	0
WDP **	m^3	1,14E+00	2,45E-03	6,11E-02	0	2,43E-04	0	6,62E-03	0
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								

Additional environmental impact indicators

Table 18: Additional environmental impact results for the product LIP 54 Primer

Results per declared unit									
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-GHG	kg CO_2 eq.	1,59E+00	4,22E-02	4,60E-02	0	4,39E-03	0	5,37E-03	0
PM	disease inc.	1,15E-03	3,10E-04	1,07E-04	0	1,33E-05	0	5,48E-05	0
IRP*	kBq U235 eq	9,10E-09	1,34E-08	1,26E-09	0	1,08E-09	0	2,13E-09	0
ETP-fw**	CTUe	1,11E-03	9,53E-04	1,99E-04	0	3,39E-05	0	1,88E-04	0
HTP-c**	CTUh	8,21E-10	7,18E-10	3,12E-10	0	4,69E-11	0	2,55E-11	0
HTP-nc**	CTUh	1,39E-04	1,41E-04	3,65E-05	0	1,63E-06	0	4,97E-06	0
SQP**	Dimensionless	3,91E+00	9,57E-01	4,99E-01	0	5,53E-02	0	9,29E-02	0
Acronyms	GWP-GHG: The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus equal to the GWP indicator originally defined in EN 15804:2012+A1:2013. PM = Particulate Matter emissions; IRP = Ionizing radiation, human health; ETP-fw = Eco-toxicity, freshwater; HTP-c = Human toxicity, cancer effects; HTP-nc = Human toxicity, non-cancer effects; SQP = Land use related impacts/Soil quality.								

Use of resources

Table 19: Resource use - LIP 54 Primer

Results per declared unit									
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	1,86E+00	1,03E-02	1,16E-01	0	9,00E-04	0	1,25E-03	0
PERM	MJ	5,97E-01	0	0	0	0	0	0	0
PERT	MJ	2,45E+00	1,03E-02	1,16E-01	0	9,00E-04	0	1,25E-03	0
PENRE	MJ	3,24E+01	7,52E-01	3,14E+00	0	7,52E-02	0	1,56E-01	0
PENRM	MJ	2,38E+01	0	0	0	0	0	0	0
PENRT	MJ	5,62E+01	7,52E-01	3,14E+00	0	7,52E-02	0	1,56E-01	0
SM	kg	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0
FW	m3	1,11E+00	2,46E-03	5,91E-02	0	2,45E-04	0	6,63E-03	0
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 production

At end of use, when the hardened product is demolished, the LIP Primers are non-hazardous building waste. The waste from packing material is also assumed to be non-hazardous waste.

Table 20: Waste - LIP 54 Primer

Results per declared unit									
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	0	0	0	0	0	0	0	0
Non-hazardous waste disposed	kg	0	0	0	0	0	0	0	0
Radioactive waste disposed	kg	0	0	0	0	0	0	0	0

Output flows

Table 21: Output flows - LIP 54 Primer

Results per declared unit									
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
Components for re-use	kg	0	0	0	0	0	0	0	0
Material for recycling	kg	0	0	5.00E-02	0	0	0	0	0
Materials for energy recovery	kg	0	0	0	0	0	0	0	0
Exported energy, electricity	MJ	0	0	0	0	0	0	0	0
Exported energy, thermal	MJ	0	0	0	0	0	0	0	0

Information on biogenic carbon content

Table 22: Biogenic Carbon - LIP 54 Primer

	Unit	**Quantity**
Biogenic carbon content in product	kg C	0
Biogenic carbon content in packaging	kg C	1,87E-02
Results per functional or declared unit. Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO2.		

LIP Supergrund

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

Core environmental impact indicators

Table 23: Core environmental impact results for the product LIP Supergrund

Results per declared unit									
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
GWP- total	kg CO_2 eq.	8,51E-01	4,35E-02	1,31E-01	0	4,35E-03	0	5,28E-03	0
GWP-fossil	kg CO_2 eq.	8,77E-01	4,35E-02	5,79E-02	0	4,35E-03	0	5,27E-03	0
GWP-biogenic	kg CO_2 eq.	-2,73E-02	1,72E-05	7,35E-02	0	4,62E-06	0	5,72E-06	0
GWP- luluc	kg CO_2 eq.	6,07E-04	1,64E-05	5,95E-05	0	1,63E-06	0	4,97E-06	0
ODP	kg CFC 11 eq.	4,75E-08	1,08E-08	2,64E-09	0	1,08E-09	0	2,13E-09	0
AP	mol H^+ eq.	3,69E-03	1,39E-04	2,66E-04	0	1,39E-05	0	4,95E-05	0
EP-freshwater	kg P- eq.	1,66E-04	2,87E-06	2,11E-05	0	2,83E-07	0	4,82E-07	0
EP- marine	kg N eq.	6,95E-04	3,11E-05	7,07E-05	0	3,10E-06	0	1,72E-05	0
EP-terrestrial	mol N eq.	7,17E-03	3,39E-04	4,84E-04	0	3,39E-05	0	1,88E-04	0
POCP	kg NMVOC eq.	3,01E-03	1,34E-04	1,92E-04	0	1,33E-05	0	5,48E-05	0
ADP-minerals&metals**	kg Sb eq.	6,46E-06	1,04E-07	4,44E-07	0	1,04E-08	0	1,20E-08	0
ADP-fossil**	MJ	2,53E+01	7,08E-01	1,54E+00	0	7,08E-02	0	1,47E-01	0
WDP **	m^3	5,15E-01	2,45E-03	2,95E-02	0	2,43E-04	0	6,62E-03	0
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								

Additional environmental impact indicators

Table 24: Additional environmental impact results for the product LIP Supergrund

Results per declared unit									
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-GHG	kg CO_2 eq.	8,48E-01	4,32E-02	8,35E-02	0	4,32E-03	0	5,18E-03	0
PM	disease inc.	3,01E-03	1,34E-04	1,92E-04	0	1,33E-05	0	5,48E-05	0
IRP*	kBq U235 eq	4,75E-08	1,08E-08	2,64E-09	0	1,08E-09	0	2,13E-09	0
ETP-fw**	CTUe	7,17E-03	3,39E-04	4,84E-04	0	3,39E-05	0	1,88E-04	0
HTP-c**	CTUh	7,49E-09	4,70E-10	6,17E-10	0	4,69E-11	0	2,55E-11	0
HTP-nc**	CTUh	6,07E-04	1,64E-05	5,95E-05	0	1,63E-06	0	4,97E-06	0
SQP**	Dimensionless	7,94E+00	5,53E-01	6,68E-01	0	5,53E-02	0	9,29E-02	0
Acronyms	GWP-GHG: The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus equal to the GWP indicator originally defined in EN 15804:2012+A1:2013. PM = Particulate Matter emissions; IRP = Ionizing radiation, human health; ETP-fw = Eco-toxicity, freshwater; HTP-c = Human toxicity, cancer effects; HTP-nc = Human toxicity, non-cancer effects; SQP = Land use related impacts/Soil quality.								

Use of resources

Table 25: Resource use - LIP Supergrund

Results per declared unit									
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	1,28E+00	1,02E-02	8,89E-02	0	9,00E-04	0	1,25E-03	0
PERM	MJ	5,60E-01	0	0	0	0	0	0	0
PERT	MJ	1,84E+00	1,02E-02	8,89E-02	0	9,00E-04	0	1,25E-03	0
PENRE	MJ	1,66E+01	7,52E-01	1,65E+00	0	7,52E-02	0	1,56E-01	0
PENRM	MJ	1,05E+01	0	0	0	0	0	0	0
PENRT	MJ	2,71E+01	7,52E-01	1,65E+00	0	7,52E-02	0	1,56E-01	0
SM	kg	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0
FW	m3	4,96E-01	2,46E-03	2,85E-02	0	2,45E-04	0	6,63E-03	0
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 production

At end of use, when the hardened product is demolished, the LIP Primers are non-hazardous building waste. The waste from packing material are also assumed to be non-hazardous waste.

Table 26: Waste - LIP Supergrund

Results per declared unit									
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	1,49E-09	0	7,44E-11	0	0	0	0	0
Non-hazardous waste disposed	kg	7,29E-05	0	3,65E-06	0	0	0	0	0
Radioactive waste disposed	kg	1,40E-05	0	6,99E-07	0	0	0	0	0

Output flows

Table 27: Output flows - LIP Supergrund

Results per declared unit									
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
Components for re-use	kg	0	0	0	0	0	0	0	0
Material for recycling	kg	0	0	3.68E-02	0	0	0	0	0
Materials for energy recovery	kg	0	0	0	0	0	0	0	0
Exported energy, electricity	MJ	0	0	0	0	0	0	0	0
Exported energy, thermal	MJ	0	0	0	0	0	0	0	0

Information on biogenic carbon content

Table 28: Biogenic Carbon - LIP Supergrund

	Unit	**Quantity**
Biogenic carbon content in product	kg C	0
Biogenic carbon content in packaging	kg C	1,75E-02
Results per functional or declared unit. Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO2.		

Additional information

Fossil free energy:
LIP Bygningsartikler A/S has used fossil free energy since 2014. Today, the energy is delivered from the wind turbine power plant at LINDØ port of Odense from Energy Fyn. The total energy consumption on the site is equivalent to 1100MWh per year.

Information related to Sector EPD

This is an individual EPD.

Differences versus previous versions

03-02-2023 (version 2, this version): The reason for updating the EPD is that based on yearly EPD surveillance plan LIP procured more specific EPD verified data from suppliers and integrated with the processes from the generic LCA software database, leading in 50% variation compared to the original version of this EPD.

References

Project Report - LIP Primers, LIP Bygningsartikler A/S, 2023
General Programme Instruction of the International EPD® System. Version 3.01.
ISO 14025:2010 Environmental labels and declarations-Type III Environmental Declarations-Principles and procedures
ISO 14040:2006 Environmental management-Life Cycle Assessment-Principles and framework
ISO 14044:2006 Environmental management-Life Cycle Assessment-Requirements and guidelines
PCR 2019:14 Construction products (EN 15804:A2) version 1.11.
EN 15804:2012+A2:2019 Sustainability of construction works-Environmental Product Declarations-Core rules for the product category of construction products
EN 12004:2007+A1:2012 for interior and exterior bonding of ceramic tiles, porcelain, natural stone and mosaics on floor
Guideline for European Technical Approval (ETAG) No. 022 Watertight covering kits for wet room floor and/or walls, Part 1 Liquid applied coverings with or without wearing surface.

Programme-related information and verification

The EPD owner has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programs may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804.

Programme:	The International EPD® System EPD International AB Box 210 60 SE-100 31 Stockholm Sweden www.environdec.com info@environdec.com
EPD registration number:	S-P-04248
Published:	2021-11-02 (version 1)

Revised:	2023-02-03 (version 2)
Valid until:	2026-10-28 (version 1, 2)

CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product category rules (PCR): PCR 2019:14 Construction products (EN 15804:A2) Version 1.11.
PCR review was conducted by: The Technical Committee of the International EPD® System. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat www.environdec.com/contact
Independent third-party verification of the declaration and data, according to ISO 14025:2006: ☐ EPD process certification ☒ EPD verification
Third party verifier: Camilla Landén, Bureau Veritas Certification Sverige AB Accredited by: SWEDAC with accreditation number 1236
Procedure for follow-up of data during EPD validity involves third party verifier: ☐ Yes ☒ No

*Disclaimer: This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

**Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

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Programme operator	the International EPD® System www.environdec.com	
3rd party verifiers	First version: Bureau Veritas Certification Sverige AB Camilla Landén Fabriksgatan 13, 412 50, Göteborg,Sweden https://www.bureauveritas.se/	

Second version:

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