

ENVIRONMENTAL PRODUCT DECLARATION

OF MULTIPLE PRODUCTS, BASED ON THE AVERAGE RESULTS OF THE
PRODUCT GROUP

IN ACCORDANCE WITH EN 15804+A2/AC:2021 & ISO 14025:2010 FOR:

Gypsum floor screeds

LM 80, LM 80 Light, LM 80 Fast, LM 35

KNAUF

Programme
Programme operator
EPD registration number
Version
Version date
Validity date
Geographical scope:
EPD Owner

The International EPD® System
EPD International AB
EPD-IES-0016744:002
2
2026-04-06
2031-04-06
Europe
Knauf Oy



GENERAL INFORMATION

EPD OWNER INFORMATION

Manufacturer	Knauf Oy
Address	Bertel Jungin aukio 1, 02601 Espoo, Finland
Contact details	myynti@knauf.com
Website	https://knauf.com/fi-FI
Management system-related certification	ISO 9001, ISO 14001
EPD author	Sandra Järv sandra.jarv@ains.fi Valtakatu 49-51, Lappeenranta A-Insinöörit Suunnittelu Oy 

Knauf was founded in 1932 and is one of the world's leading manufacturers for building products with manufacturing sites and sales organizations in more than 80 countries. The headquarters are in Iphofen, Germany, and the company is still family-owned. The Knauf Group is managed by the general partners Alexander Knauf, Manfred Grundke, and Joerg Kampmeyer. Starting with gypsum as the basic building material, the company group has expanded and diversified. It is now providing high quality solutions for drywall and ceiling systems, plasters for indoor and outdoor applications, flowing screeds, floor systems, thermal insulation materials as well as construction machines.

PROGRAMME INFORMATION

Programme	The International EPD® System
Address	EPD International AB – Box 210 60 – SE-100 31 Stockholm – Sweden
Website	http://www.environdec.com/
E-mail	support@environdec.com

PRODUCT CATEGORY RULES (PCR)

EPD standards	This EPD is in accordance with EN 15804:2012+A2:2019/AC:2021 and ISO 14025:2006
Product category rules	The CEN standard EN 15804 serves as the core PCR. In addition, the International EPD System PCR 2019:14 Construction products, version 2.0.1. (2025-06-05) is used. Product specific complementary category rules have not been applied in this EPD. PCR review was conducted by: The Technical Committee of the International EPD® System See www.environdec.com for a list of members. Chairs of the PCR review: Rob Rouwette (chair), Noa Meron (co-chair).

THIRD-PARTY VERIFICATION

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	Independent third-party verification of the declaration and data, according to ISO 14025:2006: ☒ EPD verification by individual verifier Third party verifier: Anni Oviir, LCA Support, anni.oviir@lcasupport.com Approved by: The International EPD® System
Procedure for follow-up	Procedure for follow-up of data during EPD validity involves third-party verifier: ☐ Yes ☒ No

OWNERSHIP AND LIMITATIONS ON USE OF EPD

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

Please note:

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

PRODUCT INFORMATION

PRODUCT IDENTIFICATION

Product name	Gypsum floor screeds LM 80, LM 80 Light, LM 80 Fast, and LM 35 <i>This is the average EPD for multiple products, manufactured by one manufacturer</i>
UN CPC code	375 Articles of concrete, cement and plaster
Place of production	Kankaanpää, Finland

PRODUCT DESCRIPTION AND APPLICATION

Knauf LM 80, Knauf LM 80 Light, Knauf LM 80 Fast, and Knauf LM 35 are pumpable and self-leveling floor screeds. The primary binding agent is bindable calcium sulphate, which is hydrated to form gypsum after adding water on the construction site. Products are ready-mixed, and only clean water is needed to add in the installation phase.

All the products studied serve the same end-use application, with the only distinction being the proportional composition of their raw materials.

TECHNICAL SPECIFICATIONS AND PRODUCT STANDARDS

The products comply with the standard with standard EN 13813:2002-10. More information on the technical specifications are available at <https://knauf.com/fi-FI>.

SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0,1 % (1000 ppm).

CONTENT DECLARATION

Main substances of the products covered by this EPD in declared unit (1 ton of dry mass, prior to added water) is presented in Table 1.

Products can be delivered either as bulk or packaged into big plastic bags and wooden pallets or in 30 kg paper bags.

Table 1. Product raw material and packaging composition (dry mass, prior to added water)

Product components				
Component	Composition (%)	Post-consumer material (%)	Biogenic material, kg C/DU	Material origin
Aggregate	55-69	0	0	FI
Compound for calcium sulphate screed	31-45	0		EU
TOTAL	100	0		-
Packaging materials				
Material	Weight (kg)	Weight vs the product (%)	Biogenic material, kg C/DU	Material origin
Big plastic bag	0.83	0.083	2.27	Asia
Wooden pallet	5.43	0.543		EU
Small paper bag	0.05	0.005		EU
TOTAL	6.31	0.631		-

Biogenic carbon content of the packaging is calculated utilizing the GWP biogenic A3 results. GWP biogenic A3 packaging result is 8,31 kgCO₂e and this is converted to kg C by multiplying by the molecular mass equation of 12/44.

LIFE CYCLE ASSESSMENT INFORMATION

GENERAL INFORMATION

Period for data	Calendar year 2025
Geographical scope	Product is manufactured in Finland (A1-A3) and distributed across Finland (A4-D)
LCA Software	One Click LCA, version 0.51.0
System boundaries	Cradle to gate with options, A4-A5, and modules C1-C4, D

DECLARED AND FUNCTIONAL UNIT

Declared unit	1 ton
Mass per declared unit	1000 kg (dry mass, prior to adding water)
Functional unit	Not declared
Technical lifespan	60 years

SYSTEM BOUNDARY

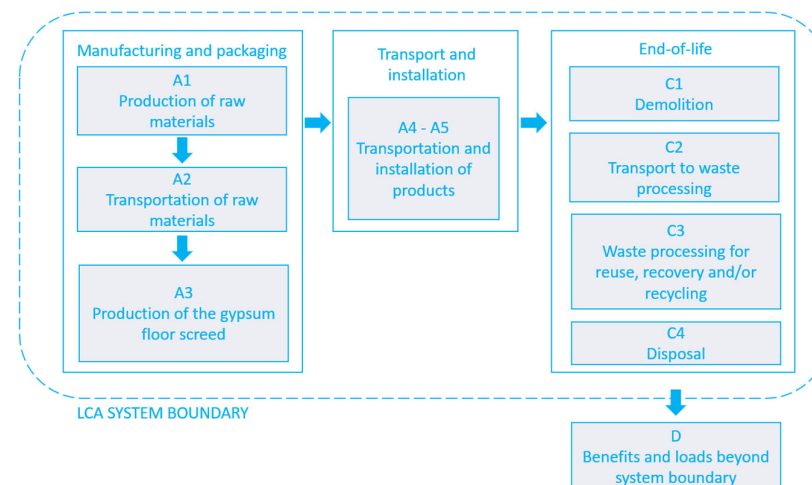


Figure 1. LCA System Boundary

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

	Product stage			Assembly stage		Use stage							End of life stage				Beyond the system boundaries		
	Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruct/demol.	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling
	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	D	D
Geography	EU	EU	FI	FI	FI	-	-	-	-	-	-	-	FI	FI	FI	FI	FI	FI	FI
Modules declared	X	X	X	X	X	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X	X	X
Primary data	86.8%			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation - products	-4 % / +30 %			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation - sites	N/A			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Not declared = ND

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.

This EPD is manufacturer specific for multiple products, based on weighted average. The weighted average has been calculated based on production volume. There was no need for averaging packaging materials and other inputs as those are the same for every product. Variations between every core impact result are represented in Annex 1.

MANUFACTURING AND PACKAGING (A1-A3)

The product stage is subdivided into three modules: A1 (Raw material supply), A2 (Transportation) and A3 (Manufacturing).

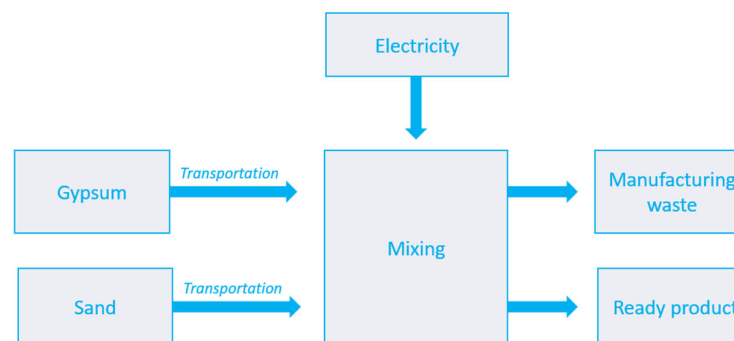


Figure 2. Manufacturing process

RAW MATERIALS A1

This stage covers the environmental impacts of manufacturing raw materials, for example, emissions generated when raw materials are taken from nature. Raw material losses are also considered. This stage includes all raw materials which end up in the final products. In our case, product consists of compound for calcium sulphate screed and aggregate.

TRANSPORTATION A2

The considered transportation impacts include exhaust emissions resulting from transportation of raw materials from suppliers to manufacturing facilities as well as the environmental impacts of the production of the fuel used. The transportation distances and methods were provided by the manufacturer. Empty returns are also considered.

MANUFACTURING A3

The environmental impacts considered for the production stage cover the manufacturing of materials used in the production but not included in the final products such as packaging materials and other ancillary materials. Also, fuels used by machines, as well as handling of waste formed in the production processes at the manufacturing facilities are included in this stage. The study considers also the losses occurring during the manufacturing processes. Also, the transmission and transformation losses of energy have been included. In this study it is considered that the products are packed to big plastic or small paper bags.

Table 2. Parameters for manufacturing energy use in stage A3

Energy type	GWP-GHG	Dataset
Electricity	0.0065 kg CO ₂ e/kWh	Electricity production, hydro, reservoir, alpine region
District heating	Not applicable	Not applicable

TRANSPORT AND INSTALLATION (A4-A5)

TRANSPORTATION A4

This module includes transportation of the product and the packaging materials from the production gate to the building site / customer. In this study an average transport distance of 268 km (one direction) is assumed. Empty returns are considered in the LCA.

INSTALLATION A5

This module includes product installation losses, emissions of energy use and other resources needed in installation and generation of waste at the installation phase.

Water and electricity use are considered. Also, the end-of-life of the packaging materials that are discarded after installation is taken account in this stage. It is assumed that all the packaging materials are incinerated and used as energy beyond the system boundaries. For waste treatment, a transport distance of 50 km is assumed because the actual location of disposal is unknown.

Transportation and installation phase is calculated based on a scenario with the parameters described in the following tables (table 3 and table 4).

Table 3. Scenario parameters for transportation in stages A4 and A5

Parameter	Value
Fuel type and consumption of vehicle used for transport	Stage A4: - Market for transport, freight, lorry, >32 metric ton, diesel, EURO 5 (0.11 kg CO₂e / tkm) Stage A5: - Market for transport, 16-32 tonne lorry, EURO 5 (0.19 kg CO₂e / tkm)
Distance (km)	Stage A4: - Assumed distance: 268 km Stage A5: - Assumed distance: 80 km for materials not to be incinerated, 130 km for materials to be incinerated
Capacity utilization (%)	100 % (empty returns included)
Density of transported products (kg/m ³)	1600 kg/m ³
Volume capacity utilization factor	1

Table 4. Scenario parameters for installation in stage A5

Parameter	Value
Installation loss	2 %
Water consumption	150 litres
Electricity consumption	0.66 kWh (per 1000 kg of dry mass with water (150 litres) added)
Electricity dataset	0.21 kg CO2e/kWh Market for electricity, low voltage, Finland
Output materials	Big plastic bags: 0.83 kg Wooden pallets: 5.43 kg Small paper bags: 0.05 kg Installation waste: 23 kg

PRODUCT USE AND MAINTENANCE (B1-B7)

Stages B1-B7 are not declared in this study. Air, soil, and water impacts during the use phase have not been studied.

PRODUCT END OF LIFE (C1-C4)

End of life stage is subdivided into four modules: C1 (Deconstruction, demolition), C2 (Transportation), C3 (Waste processing for reuse, recovery and/or recycling) and C4 (Disposal).

The additional energy needed to break this application is disregarded with 'cut-off' rule of EN 15804 because it is considered negligible. Thus, impacts in stage C1 are considered zero.

Transportation distance in stage C2 is assumed to be 80 km, according to the PCR default values. Empty returns are also taken into account.

It is assumed that the product can be collected, and that estimate 20% of the product can be recycled. This represents the emissions of the C3 module. The rest of the 80% of the mass goes for final disposal (C4). This scenario was developed in line with the common market perspective. The higher mass in waste treatment compared to the declared unit takes into account the increase due to the addition of water at the construction site.

Table 5. Scenario parameters for stages C3 and C4

Process		Value (%)	Value (kg)
Collection process	Collected separately	20	230
	Collected with mixed waste	80	920
Recovery process	For reuse	0	0
	For recycling	20	230
	For energy recovery	0	0
Final disposal	For final disposal	80	920

BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY (D)

Module D covers the net benefits and loads arising from the reuse of products or the recycling or recovery of energy from end-of-waste state materials. The impacts of 20% of the recycled product is reflected in module D. In addition, the benefits caused by the waste treatment of packaging material are addressed in this module. Exported energy and material benefits are considered.

CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the EN 15804:2012+A2:2019/AC:2021 and PCR (International EPD System PCR 2019:14 Construction products, version 2.0.1. (2025-06-05) requirements.

The study does not exclude any hazardous materials or substances. The study includes all major raw materials and energy consumption. All inputs and outputs of the unit processes, for which data is available for, are included in the calculation.

There is no neglected unit process of more than 1 % of total mass or energy flows. The module-specific total neglected input and output flows also do not exceed 5 % of energy usage or mass.

The production of capital equipment, construction activities, and infrastructure, maintenance and operation of capital equipment, and personnel-related activities are excluded. Machines and facilities (capital goods) required for and during production are also excluded, as is the transportation of employees. Installation materials in A5 are excluded due to their insignificant amount per declared unit.

Consumed electricity considers the whole factory site and hence includes a small share utilized in personnel spaces. Personnel-related waste and wastewater treatment are excluded from the study.

ALLOCATION, ESTIMATES AND ASSUMPTIONS

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.

Allocation used in Ecoinvent 3.11 environmental data sources follow the methodology 'allocation, Cut-off, EN 15804+A2'. All allocations are done as per the reference standards and the applied PCR. In this study, allocation has been done in the following ways:

Table 6. Applied allocation methodology

Data type	Allocation
Raw materials	No allocation
Packaging material	Allocated by mass
Ancillary materials	Not applicable
Manufacturing energy and waste	Allocated by mass

Scenarios included are currently in use and are representative for one of the most probable alternatives.

DATA QUALITY ASSESSMENT

The foreground data has been collected internally, considering the latest available average production amounts and measurements during the time period of 2025. Secondary data sourced from a database has been collected from Ecoinvent v3.11. The quality level in this study is qualified as good for geographical and technological representativeness, and very good for time representativeness.

The data quality assessment follows the scheme outlined in EN 15804:2012+A2:2019, Annex E, Table E.2 and in accordance with EN 15941:2024, which supports the overall reliability and representativeness of the EPD.

Table 7. Data quality assessment

Process	Source type	Source	Reference year	Data category	Share of primary data, of GWP-GHG results for A1-A3
Aggregate	Database	Ecoinvent v3.11	2024	Secondary data	0%
Compound for calcium sulphate screed	EPD	Confidential	<5 years old	Primary data	52.2%
Production of packaging materials	Database	Ecoinvent v3.11	2024	Secondary data	0%
Generation of electricity	Collected data, database	Guarantee of Origin, Ecoinvent v3.11	2024	Primary data	0.1%
Transport of the raw materials and packaging	Collected data, database	EPD owner, Ecoinvent v3.11	2025, 2024	Primary data, secondary data	34.5%
Total share of primary data, of GWP-GHG results for A1-A3					86.8%

ENVIRONMENTAL PERFORMANCE

As specified in EN 15804:2012+A2:2019/AC:2021 and the Product Category Rules, the environmental impacts are declared and reported using the baseline characterization factors from the ILCD. Primary data has been supplied by the manufacturer, and generic data is from Ecoinvent (3.11) databases. The Characterization Factors are based on EF 3.1 package.

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.

Disclaimer: The A1-A3 result should not be used without considering the results of module C. This holds for all results reported below.

Results for stages A1-A4 in the table below refer to impacts of 1 ton of manufactured dry screed, prior to adding water. Variations between every core impact result for different products are represented in Annex 1.

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

Impact category	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total ¹⁾	kg CO ₂ e	9,78E+01	3,00E+01	1,31E+01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,75E+01	1,01E+00	5,76E+00	-6,21E+00
GWP – fossil	kg CO ₂ e	1,06E+02	3,00E+01	4,77E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,75E+01	1,01E+00	5,76E+00	-3,96E+00
GWP – biogenic	kg CO ₂ e	-7,90E+00	9,04E-03	8,34E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,12E-02	1,93E-04	2,58E-03	-2,25E+00
GWP – LULUC	kg CO ₂ e	5,25E-02	1,36E-02	3,83E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,81E-03	1,04E-04	3,30E-03	-3,69E-03
Ozone depletion pot.	kg CFC ₁₁ e	7,19E-07	4,04E-07	4,37E-08	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,81E-07	1,50E-08	1,60E-07	-6,79E-08
Acidification potential	mol H ⁺ e	4,44E-01	1,04E-01	1,72E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,62E-02	9,04E-03	4,03E-02	-2,23E-02
EP-freshwater ²⁾	kg Pe	6,57E-03	3,26E-03	7,75E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,19E-03	3,25E-05	5,04E-04	-1,55E-03
EP-marine	kg Ne	1,16E-01	3,36E-02	5,52E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,89E-02	4,21E-03	1,55E-02	-4,71E-03
EP-terrestrial	mol Ne	1,27E+00	3,66E-01	5,19E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,06E-01	4,61E-02	1,69E-01	-5,40E-02
POCP (“smog”) ³⁾	kg NMVOCe	4,24E-01	1,50E-01	1,83E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	8,52E-02	1,38E-02	6,10E-02	-1,82E-02
ADP-minerals & metals ⁴⁾	kg Sbe	1,66E-04	8,50E-05	1,06E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,03E-05	3,64E-07	8,58E-06	-1,80E-05
ADP-fossil resources	MJ	1,48E+03	4,29E+02	5,80E+01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,48E+02	1,32E+01	1,41E+02	-6,90E+01
Water use ⁵⁾	m ³ e depr.	5,54E+01	2,54E+00	1,70E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,30E+00	3,39E-02	6,19E+00	-3,98E+00

1) GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

Impact category	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter	Incidence	5,92E-06	2,93E-06	2,88E-07	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,40E-06	1,97E-06	9,27E-07	-2,76E-07
Ionizing radiation ⁶⁾	kBq U235e	1,99E+00	3,71E-01	3,25E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,96E-01	5,60E-03	8,44E-02	-5,84E-01
Ecotoxicity (freshwater)	CTUe	1,13E+03	4,88E+02	5,26E+02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,09E+02	7,52E+00	9,41E+01	-8,99E+01
Human toxicity, cancer	CTUh	2,80E-08	4,90E-09	1,15E-09	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,99E-09	1,03E-10	1,04E-09	-8,48E-10
Human tox. non-cancer	CTUh	9,09E-07	2,75E-07	4,41E-08	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,55E-07	1,62E-09	2,35E-08	-2,83E-08
SQP ⁷⁾	-	1,80E+03	4,25E+02	6,60E+01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,47E+02	8,71E-01	2,77E+02	-3,61E+01

6) EN 15804+A2 disclaimer for ionizing radiation, human health. 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; 7) SQP = Land use related impacts/soil quality.

USE OF NATURAL RESOURCES

Impact category	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy ⁶⁾	MJ	1,73E+02	5,94E+00	-7,49E+01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,04E+00	8,26E-02	1,32E+00	1,04E+01
Renew. PER as material	MJ	8,27E+01	0,00E+00	-8,27E+01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,23E+01
Total use of renew. PER	MJ	2,56E+02	5,94E+00	-1,58E+02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,04E+00	8,26E-02	1,32E+00	3,27E+01
Non-re. PER as energy	MJ	1,44E+03	4,29E+02	2,25E+01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,48E+02	1,32E+01	1,41E+02	-6,90E+01
Non-re. PER as material	MJ	3,51E+01	0,00E+00	-3,51E+01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,60E+01
Total use of non-re. PER	MJ	1,48E+03	4,29E+02	-1,26E+01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,48E+02	1,32E+01	1,41E+02	-5,30E+01
Secondary materials	kg	6,19E-01	1,79E-01	2,70E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,11E-01	5,45E-03	3,51E-02	3,48E-01
Renew. secondary fuels	MJ	2,78E+00	2,33E-03	5,57E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,46E-03	1,43E-05	7,32E-04	-5,97E-04
Non-ren. secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m³	1,36E+00	6,34E-02	8,97E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,00E-02	8,44E-04	1,46E-01	-9,22E-02

6) PER = Primary energy resources

END OF LIFE – WASTE

Impact category	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	1,85E+00	9,42E-01	1,15E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,55E-01	1,48E-02	1,60E-01	-3,04E-01
Non-hazardous waste	kg	4,42E+01	1,80E+01	7,23E+01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	7,63E+00	2,15E-01	3,71E+00	-1,47E+01
Radioactive waste	kg	8,69E-03	9,07E-05	2,37E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	7,30E-05	1,38E-06	2,06E-05	-1,47E-04

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	0,00E+00	0,00E+00	2,11E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	2,30E+02	0,00E+00	0,00E+00
Materials for energy rec	kg	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	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	5,79E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy – Heat	MJ	0,00E+00	0,00E+00	7,97E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

ENVIRONMENTAL IMPACTS – GWP-GHG - THE INTERNATIONAL EPD SYSTEM

Impact category	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG ⁷⁾	kg CO ₂ e	1,06E+02	3,00E+01	4,78E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,75E+01	1,01E+00	5,76E+00	-3,96E+00

7) This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product as defined by IPCC AR 5 (IPCC 2013). In addition, the characterisation factors for the flows - CH₄ fossil, CH₄ biogenic and Dinitrogen monoxide - were updated in line with the guidance of IES PCR 1.3.2 Annex 1. This indicator is identical to the GWP-total of EN 15804:2012+A2:2019 except that the characterization factor for biogenic CO₂ is set to zero.

ENVIRONMENTAL IMPACTS – ALTERNATIVE END-OF-LIFE SCENARIOS

If any of the declared scenarios is a mix of end-of life alternatives, also the corresponding 100% scenarios shall be declared. The following section shows the result for modules C1-C4 and D with 100% landfill and 100% recycling scenarios.

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

Impact category	Unit	100% landfill					100% recycling				
		C1	C2	C3	C4	D	C1	C2	C3	C4	D
GWP – total ¹⁾	kg CO ₂ e	0,00E+00	1,75E+01	0,00E+00	7,20E+00	-3,98E+00	0,00E+00	1,75E+01	5,06E+00	0,00E+00	-1,51E+01
GWP – fossil	kg CO ₂ e	0,00E+00	1,75E+01	0,00E+00	7,20E+00	-1,74E+00	0,00E+00	1,75E+01	5,06E+00	0,00E+00	-1,28E+01
GWP – biogenic	kg CO ₂ e	0,00E+00	1,12E-02	0,00E+00	3,23E-03	-2,24E+00	0,00E+00	1,12E-02	9,63E-04	0,00E+00	-2,27E+00
GWP – LULUC	kg CO ₂ e	0,00E+00	5,81E-03	0,00E+00	4,12E-03	-1,58E-03	0,00E+00	5,81E-03	5,18E-04	0,00E+00	-1,21E-02
Ozone depletion pot.	kg CFC-11e	0,00E+00	3,81E-07	0,00E+00	2,00E-07	-5,05E-08	0,00E+00	3,81E-07	7,51E-08	0,00E+00	-1,38E-07
Acidification potential	mol H ⁺ e	0,00E+00	5,62E-02	0,00E+00	5,04E-02	-8,44E-03	0,00E+00	5,62E-02	4,52E-02	0,00E+00	-7,79E-02
EP-freshwater ²⁾	kg Pe	0,00E+00	1,19E-03	0,00E+00	6,30E-04	-7,84E-04	0,00E+00	1,19E-03	1,63E-04	0,00E+00	-4,60E-03
EP-marine	kg Ne	0,00E+00	1,89E-02	0,00E+00	1,93E-02	-1,39E-03	0,00E+00	1,89E-02	2,10E-02	0,00E+00	-1,80E-02
EP-terrestrial	mol Ne	0,00E+00	2,06E-01	0,00E+00	2,11E-01	-1,39E-02	0,00E+00	2,06E-01	2,30E-01	0,00E+00	-2,15E-01
POCP ("smog") ³⁾	kg NMVOCe	0,00E+00	8,52E-02	0,00E+00	7,63E-02	-7,09E-03	0,00E+00	8,52E-02	6,89E-02	0,00E+00	-6,26E-02
ADP-minerals & metals ⁴⁾	kg Sbe	0,00E+00	6,03E-05	0,00E+00	1,07E-05	-4,63E-06	0,00E+00	6,03E-05	1,82E-06	0,00E+00	-7,14E-05
ADP-fossil resources	MJ	0,00E+00	2,48E+02	0,00E+00	1,76E+02	-4,15E+01	0,00E+00	2,48E+02	6,59E+01	0,00E+00	-1,79E+02
Water use ⁵⁾	m ³ e depr.	0,00E+00	1,30E+00	0,00E+00	7,74E+00	-5,04E-01	0,00E+00	1,30E+00	1,70E-01	0,00E+00	-1,79E+01

ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

Impact category	Unit	100% landfill					100% recycling				
		C1	C2	C3	C4	D	C1	C2	C3	C4	D
Particulate matter	Incidence	0,00E+00	1,40E-06	0,00E+00	1,16E-06	-5,73E-08	0,00E+00	1,40E-06	9,84E-06	0,00E+00	-1,15E-06
Ionizing radiation ⁶⁾	kBq U235e	0,00E+00	2,96E-01	0,00E+00	1,05E-01	-3,93E-01	0,00E+00	2,96E-01	2,80E-02	0,00E+00	-1,35E+00
Ecotoxicity (freshwater)	CTUe	0,00E+00	2,09E+02	0,00E+00	1,18E+02	-2,44E+01	0,00E+00	2,09E+02	3,76E+01	0,00E+00	-3,52E+02
Human toxicity, cancer	CTUh	0,00E+00	2,99E-09	0,00E+00	1,31E-09	-2,37E-10	0,00E+00	2,99E-09	5,15E-10	0,00E+00	-3,29E-09
Human tox. non-cancer	CTUh	0,00E+00	1,55E-07	0,00E+00	2,93E-08	-1,04E-08	0,00E+00	1,55E-07	8,10E-09	0,00E+00	-1,00E-07
SQP ⁷⁾	-	0,00E+00	1,47E+02	0,00E+00	3,46E+02	-1,04E+01	0,00E+00	1,47E+02	4,35E+00	0,00E+00	-1,39E+02

6) EN 15804+A2 disclaimer for ionizing radiation, human health. 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; 7) SQP = Land use related impacts/soil quality.

USE OF NATURAL RESOURCES

Impact category	Unit	100% landfill					100% recycling				
		C1	C2	C3	C4	D	C1	C2	C3	C4	D
Renew. PER as energy ⁶⁾	MJ	0,00E+00	4,04E+00	0,00E+00	1,65E+00	1,29E+01	0,00E+00	4,04E+00	4,13E-01	0,00E+00	2,50E-01
Renew. PER as material	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,23E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,23E+01
Total use of renew. PER	MJ	0,00E+00	4,04E+00	0,00E+00	1,65E+00	3,52E+01	0,00E+00	4,04E+00	4,13E-01	0,00E+00	2,25E+01
Non-re. PER as energy	MJ	0,00E+00	2,48E+02	0,00E+00	1,76E+02	-4,15E+01	0,00E+00	2,48E+02	6,59E+01	0,00E+00	-1,79E+02
Non-re. PER as material	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,60E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,60E+01
Total use of non-re. PER	MJ	0,00E+00	2,48E+02	0,00E+00	1,76E+02	-2,55E+01	0,00E+00	2,48E+02	6,59E+01	0,00E+00	-1,63E+02
Secondary materials	kg	0,00E+00	1,11E-01	0,00E+00	4,38E-02	3,79E-01	0,00E+00	1,11E-01	2,73E-02	0,00E+00	2,25E-01
Renew. secondary fuels	MJ	0,00E+00	1,46E-03	0,00E+00	9,15E-04	-3,72E-04	0,00E+00	1,46E-03	7,14E-05	0,00E+00	-1,50E-03
Non-ren. secondary fuels	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	0,00E+00
Use of net fresh water	m³	0,00E+00	3,00E-02	0,00E+00	1,82E-01	-1,20E-02	0,00E+00	3,00E-02	4,22E-03	0,00E+00	-4,13E-01

6) PER = Primary energy resources

END OF LIFE – WASTE

Impact category	Unit	100% landfill					100% recycling				
		C1	C2	C3	C4	D	C1	C2	C3	C4	D
Hazardous waste	kg	0,00E+00	3,55E-01	0,00E+00	2,01E-01	-8,18E-02	0,00E+00	3,55E-01	7,38E-02	0,00E+00	-1,19E+00
Non-hazardous waste	kg	0,00E+00	7,63E+00	0,00E+00	4,64E+00	-1,05E+01	0,00E+00	7,63E+00	1,08E+00	0,00E+00	-3,15E+01
Radioactive waste	kg	0,00E+00	7,30E-05	0,00E+00	2,57E-05	-1,01E-04	0,00E+00	7,30E-05	6,88E-06	0,00E+00	-3,30E-04

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	100% landfill					100% recycling				
		C1	C2	C3	C4	D	C1	C2	C3	C4	D
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,15E+03	0,00E+00	0,00E+00
Materials for energy rec	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	0,00E+00	0,00E+00
Exported energy – Electricity	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy – Heat	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	0,00E+00

ENVIRONMENTAL IMPACTS – GWP-GHG - THE INTERNATIONAL EPD SYSTEM

Impact category	Unit	100% landfill					100% recycling				
		C1	C2	C3	C4	D	C1	C2	C3	C4	D
GWP-GHG ⁷⁾	kg CO ₂ e	0,00E+00	1,75E+01	0,00E+00	7,20E+00	-1,74E+00	0,00E+00	1,75E+01	5,06E+00	0,00E+00	-1,28E+01

7) This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product as defined by IPCC AR 5 (IPCC 2013). In addition, the characterisation factors for the flows - CH₄ fossil, CH₄ biogenic and Dinitrogen monoxide - were updated in line with the guidance of IES PCR 1.3.2 Annex 1. This indicator is identical to the GWP-total of EN 15804:2012+A2:2019 except that the characterization factor for biogenic CO₂ is set to zero.

REFERENCES

Standards and PCR

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 15804:2012+A2:2019/AC:2021 Sustainability in construction works – Environmental product declarations – Core rules for the product category of construction products.

International EPD System PCR 2019:14 Construction products (EN 15804+A2) (version 2.0.1)

EPD International (2025). General Programme Instructions for the International EPD System. Version 5.0.1. www.environdec.com.

Data references:

Ecoinvent v3.11 database

VERSION HISTORY

Original Version of the EPD, 2024-09-23

Version 002 2026-04-06 – Added LM 80 Fast and updated previously reviewed products

ABBREVIATIONS

Abbreviation	Definition
General	
EPD	Environmental Product Declaration
LCA	Life Cycle Assessment
DU	Declared Unit
EF	Environmental Footprint
ISO	International Organization for Standardization
PCR	Product Category Rules
c-PCR	Complementary Product Category Rules
GRI	Global Reporting Initiative
GPI	General Programme Instructions
ND	Not Declared
GHG	Greenhouse gas
Technical	
MJ	Megajoule
m ³	Cubic Meter
kWh	Kilowatt-hour
kg	Kilogram
kg C	Kilograms of Carbon
kg CO ₂ eq.	Kilograms of Carbon Dioxide Equivalent
tkm	Tonne-kilometer

ANNEX 1: VARIATIONS BETWEEN CORE IMPACT RESULTS

Note: There are variations only in stages A1-A3. Other stages have no variations between products.

			LM 80		LM 80 Light		LM 80 Fast		LM 35	
Impact category	Unit	Weighted average A1-A3	Results A1-A3	Variation to weighted average	Results A1-A3	Variation to weighted average	Results A1-A3	Variation to weighted average	Results A1-A3	Variation to weighted average
GWP – total	kg CO ₂ e	97,8	102	+4,3 %	93,9	-4,0 %	101	+3,3 %	130	+32,9 %
GWP – fossil	kg CO ₂ e	106	109	+2,8 %	102	-3,8 %	109	+2,8 %	137	+29,2 %
GWP – biogenic	kg CO ₂ e	-7,9	-7,89	-0,1 %	-7,92	+0,3 %	-7,88	-0,3 %	-7,76	-1,8 %
GWP – LULUC	kg CO ₂ e	0,0525	0,0539	+2,7 %	0,0510	-2,9 %	0,0534	+1,7 %	0,0644	+22,7 %
Ozone depletion pot.	kg CFC-11e	7,19E-07	7,4E-07	+2,9 %	7,04E-07	-2,1 %	7,09E-07	-1,4 %	8,69E-07	+20,9 %
Acidification potential	mol H ⁺ e	0,444	0,458	+3,2 %	0,429	-3,4 %	0,457	+2,9 %	0,564	+27,0 %
EP-freshwater	kg Pe	0,00657	0,00671	+2,1 %	0,00648	-1,4 %	0,00645	-1,8 %	0,00757	+15,2 %
EP-marine	kg Ne	0,116	0,119	+2,6 %	0,112	-3,4 %	0,118	+1,7 %	0,144	+24,1 %
EP-terrestrial	mol Ne	1,27	1,31	+3,1 %	1,23	-3,1 %	1,29	+1,6 %	1,58	+24,4 %
POCP (“smog”)	kg NMVOCe	0,424	0,436	+2,8 %	0,412	-2,8 %	0,429	+1,2 %	0,526	+24,1 %
ADP-minerals & metals	kg Sbe	0,000166	0,00017	+2,4 %	0,000163	-1,8 %	0,000163	-1,8 %	0,000194	+16,9 %
ADP-fossil resources	MJ	1480	1530	+3,4 %	1420	-4,1 %	1520	+2,7 %	1910	+29,1 %
Water use	m ³ e depr.	55,4	55	-0,7 %	56	+1,1 %	54,4	-1,8 %	51,4	-7,2 %