ENVIRONMENTAL PRODUCT DECLARATION

OF MULTIPLE PRODUCTS, BASED ON WEIGHTED AVERAGE

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

Gypsum floor screeds

LM 80, LM 80 Light, LM 35

Programme: The international EPD® system
Programme operator: EPD International AB
EPD registration number: EPD-IES-0016744
Version: 1
Publication date: 2024-09-23
Valid until: 2029-08-22
Geographical scope: Europe
EPD owner: Knauf Oy

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 may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

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

GENERAL INFORMATION

MANUFACTURER 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

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.

EPD INFORMATION

EPD program operator	The International EPD System EPD International AB – Box 210 60 – SE-100 31 Stockholm - Sweden
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 Int'l EPD System PCR 2019:14 Construction products, version 1.3.4 (2024-04-30) is used. Product specific complementary category rules have not been applied in this EPD.
LCA software	One Click LCA
EPD author	Elisa Lindqvist and Kasper Karjalainen Ilmarisenkatu 18, 20520 Turku A-Insinöörit Suunnittelu Oy
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☒ Internal verification ☒ External verification
Verification date	2024-08-22
EPD verifier	Anni Oviir, Rangi Maja OÜ, https://www.lcasupport.com/
EPD number	EPD-IES-0016744
Publishing date	2024-09-23
EPD valid until	24-08-22

PRODUCT INFORMATION

PRODUCT IDENTIFICATION

Product name	Gypsum floor screeds LM 80, LM 80 Light and LM 35 *This is average EPD for multiple products, manufactured by one manufacturer*
Additional label(s)	-
Product number / reference	-
Place(s) of production	Kilvakkala, Finland

PRODUCT DESCRIPTION AND APPLICATION

Knauf LM 80, Knauf LM 80 Light 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 installation phase.

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.

PRODUCT RAW MATERIAL MAIN COMPOSITION

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 fiber glass bags and wooden pallets or in 30 kg paper bags. In this study it is assumed that the products are delivered in fiber glass bags and wooden pallets.

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

Product components	Weight (kg)	Post-consumer material weight (%)	Biogenic material weight, kg C/kg	Material origin
Aggregate	692.68	0	0	FI
Compound for calcium sulphate screed	307.32	0		EU
TOTAL	1000.00	0		-
Packaging materials	**Weight (kg)**	**Weight-% (vs the product)**	**Biogenic material, weight, kg C/kg**	**Material origin**
Fiber glass big bag	1.63	0.163 %	0	EU
Wooden pallet	20.83	2.083 %	0.45	EU
TOTAL	22.46	2.246 %	0.45	-

Biogenic carbon content of the packaging wood is assumed to be 212 kg C / m^3 and weight of the m^3 is assumed to be 470 kg.

SUBSTANCES, REACH - VERY HIGH CONCERN

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

PRODUCT LIFE CYCLE

MANUFACTURING AND PACKAGING (A1-A3)

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

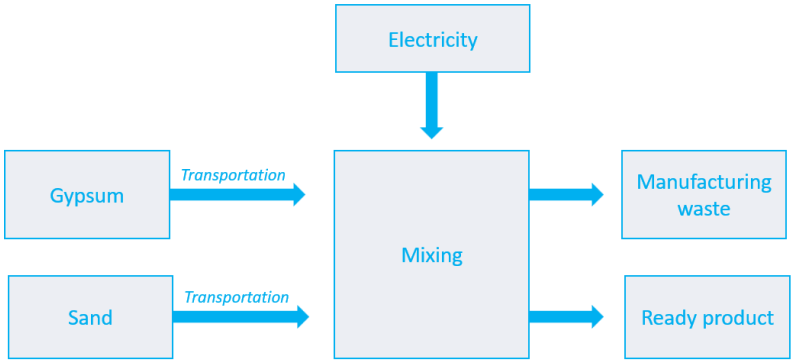

Figure 1. Manufacturing process

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 losses of energy have been included. In this study it is considered that the products are packed to fiber glass big bags.

Table 2. Parameters for manufacturing energy use in stage A3

Energy type	GWP-value	Data quality
Electricity	0.68 kg CO_2e/kWh	Electricity, Finland, residual mix
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 is considered. Also, the end-of-life of the packaging materials that are discarded after installation are 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	Transport, freight, lorry 16-32 metric ton, EURO5 (0.17 kg CO2e / tkm)
Distance (km)	Stage A4: • Assumed distance: 268 km Stage A5: • Assumed distance: 50 km
Capacity utilization (%)	100 % (empty returns included)
Density of transported products (kg/m3)	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)
Output materials	Wooden pallets: 21.25 kg Fiber glass big bags: 1.66 kg Installation waste: 23 kg (with water added)

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 quantity of extra energy required to break this application is neglected as the product is typically not considered as part of the structure of the building. Thus, impacts in stage C1 are considered as zero.

Transportation distance in stage C2 is assumed to be 50 km. Empty returns are also taken into account.

It is assumed that product can't be reused, recycled or recovered, hence no environmental loads are attributed to stage C3. Due this, it is assumed that 100 % goes for final disposal (C4). The higher mass of waste for landfill 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	0	0
	Collected with mixed waste	0	0
Recovery process	For reuse	0	0
	For recycling	0	0
	For energy recovery	0	0
Final disposal	For final disposal	100	1150

BENEFITS AND LOADS BEYONED SYSTEM BOYNDARY (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. In our case product is not reused, recycled or recovered at the end of life, thus there are no impacts arising from the product itself in stage D. Exported energy from incineration of packaging materials (from stage A5) have been considered.

LIFE-CYCLE ASSESSMENT

LIFE-CYCLE ASSESSMENT INFORMATION

Period for data	1.1.2023-31.12.2023

DECLARED AND FUNCTIONAL UNIT

Declared unit	1 ton
Mass per declared unit	1000 kg (dry mass, prior to adding water)
Functional unit	Not declared
Reference service life	Not declared

SYSTEM BOUNDARY

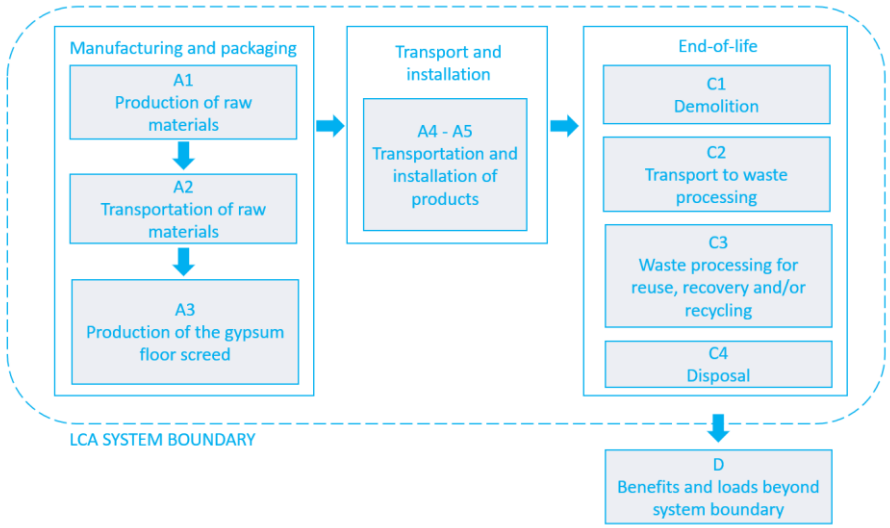

Figure 2. LCA System Boundary

	Product stage			Assembly stage		Use stage							End of life stage				Beyond the system boundaries		
	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	MND	MND	MND	MND	MND	MND	MND	x	x	x	x	x	x	x
	Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstr./demol.	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling

Modules not declared = MND

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 (Int'l EPD System PCR 2019:14 Construction products, version 1.3.4 (2024-04-30) requirements.

The study does not exclude any hazardous materials or substances. The study includes all major raw material 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 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. Machines and facilities (capital goods) required for and during production are excluded, as is transportation of employees.

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.

The allocations in the Ecoinvent 3.8 datasets used in this study follow the Ecoinvent system model 'Allocation, cut-off, EN15804'

In this study allocation was not needed as all the inputs was known by product level.

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

AVERAGES AND VARIABILITY

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

The International EPD System additional data requirements

Data specificity and GWP-GHG variability for GWP-GHG for A1-A3.

Supply-chain specific data for GWP-GHG	> 90 %
Variation in GWP-GHG between products	-3.8 % / +35.4 %
Variation in GWP-GHG between sites	N/A

ENVIRONMENTAL IMPACT DATA

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. Specific data has been supplied by the manufacturer, and generic data is from Ecoinvent (3.8) databases. The Characterization Factors are based on EF 3.0 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, PEF

Impact category	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total[1)]	kg CO_2e	1,01E+02	4,56E+01	3,87E+01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	9,56E+00	0,00E+00	1,49E+01	-1,76E+01
GWP – fossil	kg CO_2e	1,30E+02	4,55E+01	8,77E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	9,56E+00	0,00E+00	1,49E+01	-1,76E+01
GWP – biogenic	kg CO_2e	-2,99E+01	0,00E+00	2,99E+01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-2,33E-02
GWP – LULUC	kg CO_2e	7,87E-02	1,79E-02	3,96E-03	MND	MND	MND	MND	MND	MND	MND	0,00E+00	3,75E-03	0,00E+00	1,54E-02	-2,77E-02
Ozone depletion pot.	kg $CFC_{-11}e$	1,64E-05	1,05E-05	7,03E-07	MND	MND	MND	MND	MND	MND	MND	0,00E+00	2,21E-06	0,00E+00	3,85E-06	-9,62E-07
Acidification potential	mol H^+e	5,38E-01	1,85E-01	2,20E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	3,88E-02	0,00E+00	3,70E+01	-1,36E-01
EP-freshwater[2)]	kg Pe	1,04E-03	3,20E-04	4,65E-05	MND	MND	MND	MND	MND	MND	MND	0,00E+00	6,71E-05	0,00E+00	3,60E-04	-6,93E-04
EP-marine	kg Ne	1,24E-01	5,52E-02	6,43E-03	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,16E-02	0,00E+00	3,81E-02	-1,60E-02
EP-terrestrial	mol Ne	1,37E+00	6,09E-01	7,04E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,28E-01	0,00E+00	4,21E-01	-1,88E-01
POCP ("smog")[3)]	kg NMVOCe	4,36E-01	1,86E-01	2,06E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	3,91E-02	0,00E+00	2,41E+00	-5,19E-02
ADP-minerals & metals[4)]	kg Sbe	2,65E-04	1,61E-04	1,36E-05	MND	MND	MND	MND	MND	MND	MND	0,00E+00	3,39E-05	0,00E+00	4,89E-05	-1,54E-05
ADP-fossil resources	MJ	1,93E+03	6,76E+02	6,97E+01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,42E+02	0,00E+00	3,21E+02	-2,22E+02
Water use[5)]	m^3e depr.	1,56E+01	3,13E+00	2,12E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	6,56E-01	0,00E+00	2,59E+00	-2,65E+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.

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	2,48E+02	9,70E+00	6,75E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	2,03E+00	0,00E+00	1,09E+01	-4,74E+01
Renew. PER as material	MJ	2,62E+02	0,00E+00	-2,62E+02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renew. PER	MJ	5,10E+02	9,70E+00	-2,55E+02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	2,03E+00	0,00E+00	1,09E+01	-4,74E+01
Non-re. PER as energy	MJ	1,91E+03	6,76E+02	6,93E+01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,42E+02	0,00E+00	3,21E+02	-2,22E+02
Non-re. PER as material	MJ	7,06E+01	0,00E+00	-7,06E+01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of non-re. PER	MJ	1,98E+03	6,76E+02	-1,28E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,42E+02	0,00E+00	3,21E+02	-2,22E+02
Secondary materials	kg	1,31E+00	2,27E-01	4,39E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	4,76E-02	0,00E+00	1,08E-01	-1,64E-02
Renew. secondary fuels	MJ	8,84E+00	2,50E-03	1,77E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	5,24E-04	0,00E+00	3,94E-03	-1,08E-04
Non-ren. secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m^3	1,13E+00	8,51E-02	1,80E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,78E-02	0,00E+00	3,34E-01	-1,76E-01

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	2,04E+00	7,59E-01	7,94E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,59E-01	0,00E+00	0,00E+00	-1,37E+00
Non-hazardous waste	kg	6,09E+01	1,35E+01	4,50E+01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	2,83E+00	0,00E+00	1,15E+03	-5,54E+01
Radioactive waste	kg	1,56E-02	4,66E-03	5,02E-04	MND	MND	MND	MND	MND	MND	MND	0,00E+00	9,77E-04	0,00E+00	0,00E+00	-1,25E-03

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	MND	MND	MND	MND	MND	MND	MND	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	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy rec	kg	0,00E+00	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy	MJ	0,00E+00	0,00E+00	2,57E+02	MND	MND	MND	MND	MND	MND	MND	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_2e	1,30E+02	4,55E+01	8,77E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	9,56E+00	0,00E+00	1,49E+01	-1,76E+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.

ENVIRONMENTAL IMPACTS - EN 15804+A1, CML

Impact category	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Pot.	kg CO2e	7,64E+01	4,51E+01	7,65E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	9,47E+00	0,00E+00	1,46E+01	-1,72E+01
Ozone depletion Pot.	kg CFC-11e	1,30E-05	8,35E-06	5,61E-07	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,75E-06	0,00E+00	3,07E-06	-7,86E-07
Acidification	kg SO2e	3,25E-01	1,44E-01	1,49E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	3,01E-02	0,00E+00	3,39E+01	-1,16E-01
Eutrophication	kg PO43e	7,30E-02	3,26E-02	6,10E-03	MND	MND	MND	MND	MND	MND	MND	0,00E+00	6,84E-03	0,00E+00	2,61E-02	-2,49E-02
POCP (“smog”)	kg C2H4e	1,52E-02	5,88E-03	6,29E-04	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,23E-03	0,00E+00	1,36E+00	-5,03E-03
ADP-elements	kg Sbe	2,60E-04	1,58E-04	1,32E-05	MND	MND	MND	MND	MND	MND	MND	0,00E+00	3,31E-05	0,00E+00	4,70E-05	-1,55E-05
ADP-fossil	MJ	1,28E+03	6,76E+02	5,63E+01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,42E+02	0,00E+00	3,21E+02	-2,18E+02

BIBLIOGRAPHY

- 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.
- Ecoinvent database v3.8 (2021) and One Click LCA database.
- EN 15804:2012+A2:2019/AC:2021 Sustainability in construction works – Environmental product declarations – Core rules for the product category of construction products.
- Int'l EPD System PCR 2019:14 Construction products, version 1.3.4 (2024-04-30)
- EPD International (2021). General Programme Instructions of the international EPD® system. Version 4.0. www.environdec.com.
- LCA background report 27.008.2024

ANNEX1: 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 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**
GWP – total	kg CO_2e	1,01E+02	1,11E+02	+9,9 %	9,50E+01	-5,9 %	1,46E+02	+44,6 %
GWP – fossil	kg CO_2e	1,30E+02	1,41E+02	+8,5 %	1,25E+02	-3,8 %	1,76E+02	+35,4 %
GWP – biogenic	kg CO_2e	-2,99E+01	-2,99E+01	+0,0 %	-2,99E+01	0,0 %	-2,99E+01	+0,0 %
GWP – LULUC	kg CO_2e	7,87E-02	8,24E-02	+4,7 %	7,67E-02	-2,5 %	9,49E-02	+20,6 %
Ozone depletion pot.	kg CFC_{-11}e	1,64E-05	1,76E-05	+7,3 %	1,57E-05	-4,3 %	2,17E-05	+32,3 %
Acidification potential	mol H^+e	5,38E-01	5,75E-01	+6,9 %	5,19E-01	-3,5 %	6,98E-01	+29,7 %
EP-freshwater	kg Pe	1,04E-03	1,07E-03	+2,9 %	1,02E-03	-1,9 %	1,18E-03	+13,5 %
EP-marine	kg Ne	1,24E-01	1,31E-01	+5,6 %	1,20E-01	-3,2 %	1,57E-01	+26,6 %
EP-terrestrial	mol Ne	1,37E+00	1,45E+00	+5,8 %	1,32E+00	-3,6 %	1,73E+00	+26,3 %
POCP (“smog”)	kg NMVOCe	4,36E-01	4,63E-01	+6,2 %	4,22E-01	-3,2 %	5,55E-01	+27,3 %
ADP-minerals & metals	kg Sbe	2,65E-04	2,75E-04	+3,8 %	2,59E-04	-2,3 %	3,11E-04	+17,4 %
ADP-fossil resources	MJ	1,93E+03	2,09E+03	+8,3 %	1,85E+03	-4,1 %	2,60E+03	+34,7 %
Water use	m^3e depr.	1,56E+01	1,60E+01	+2,6 %	1,54E+01	-1,3 %	1,75E+01	+12,2 %