

# ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025 / ISO 21930



## Fescon Flow GS 3.0 mm Gypsum floor screed

PROGRAMME: THE INTERNATIONAL EPD® SYSTEM, [WWW.ENVIRONDEC.COM](http://WWW.ENVIRONDEC.COM)

Programme operator: **EPD International AB** | EPD registration number: S-P-06040 | Publication date: 2022-05-19 | Valid until: 2027-05-18 | Geographical scope : EU 27

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](http://www.environdec.com).

## GENERAL INFORMATION

### MANUFACTURER INFORMATION

<b>Manufacturer</b>	Fescon Oy
<b>Address</b>	Hämeenkatu 9, 05800 Hyvinkää
<b>Contact details</b>	fescon@fescon.fi
<b>Website</b>	www.fescon.fi

### PRODUCT IDENTIFICATION

<b>Product name</b>	Fescon Flow GS 3.0 mm Gypsum floor screed
<b>Additional label(s)</b>	Fescon Flow GS 3,0 mm Kipsilattiamassa
<b>Product number / reference</b>	33149
<b>Place(s) of production</b>	Fescon Oy, Hikiäntie 1336, 05820 Hyvinkää, Finland
<b>CPC code</b>	1520 Gypsum; anhydrite; limestone flux; limestone and other calcareous stone, of a kind used for the manufacture of lime or cement

#### The International EPD System

*EPDs within the same product category but from different programmes may not be comparable.*

### EPD INFORMATION

The EPD owner has the sole ownership, liability, and responsibility for the EPD. Construction products EPDs may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

<b>EPD program operator</b>	The International EPD System
<b>EPD standards</b>	This EPD is in accordance with EN 15804+A2 and ISO 14025 standards.
<b>Product category rules</b>	The CEN standard EN 15804 serves as the core PCR. In addition, the Int'l EPD System PCR 2019:14 Construction products, version 1.11 (05.02.2021) is used.
<b>EPD author</b>	Oskar Leinonen, Fescon Oy
<b>EPD verification</b>	Independent verification of this EPD and data, according to ISO 14025: <input type="checkbox"/> Internal certification <input checked="" type="checkbox"/> External verification
<b>Verification date</b>	2022-05-18
<b>EPD verifier</b>	Anni Oviir, Rangi Maja OÜ, www.lcasupport.com
<b>EPD number</b>	S-P-06040
<b>ECO Platform nr.</b>	-
<b>Publishing date</b>	2022-05-19
<b>EPD valid until</b>	2027-05-18

## PRODUCT INFORMATION

### PRODUCT DESCRIPTION

The product is gypsum based floor screed that contains gypsum, sand and additives.

### PRODUCT APPLICATION

Flow GS 3.0 mm Gypsum floor screed is a pump-applied, easily levelling floor compound with a gypsum binder and having excellent workability and spreading characteristics. Suitable for heated floor structures, in particular.

### TECHNICAL SPECIFICATIONS

Consumption: 1,8 kg/m<sup>2</sup>/ 1 mm  
 Recommended layer thickness: 20-80 mm  
 Maximum grain size: 3,0 mm  
 Usage temperature: + 10 °C - + 25°C  
 Specific information from the data sheet.

### PRODUCT STANDARDS

M1-approved  
 Flow GS 3.0 mm Gypsum floor screed is produced according to the requirements of EN 13813 (Screed material and floor screeds - Screed materials)

### PHYSICAL PROPERTIES OF THE PRODUCT

Additional information can be found at the links below:  
<https://www.fescon.fi/en/products/floor-leveling-products/1951/flow-gs-30-mm-gypsum-floor-mass>  
<https://www.fescon.fi/tuotteet/lattiatasoitteet/lattiatasoitteet-ja-pohjusteet/1726/flow-gs-3-0-mm-kipsilattiamassa>

### ADDITIONAL TECHNICAL INFORMATION

Further information can be found at [www.fescon.fi](http://www.fescon.fi).

### PRODUCT RAW MATERIAL COMPOSITION

Product and Packaging Material	Material share %	Material mass kg	Post-consumer %	Renewable %	Country Region of origin
Sand	50-70	0,5-0,7	-	-	EU
Gypsum	20-40	0,2-0,4	-	-	EU
Lime	5-20	0,05-0,2	-	-	EU
Additives	< 5	< 0,05	-	-	EU
Plastic packaging	< 0,2	< 0,2	-	-	EU

### 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 floor screed is manufactured by adding the raw materials together and mixing them as a dry blend, forming a homogenous and high quality floor screed. Following this process, the mix is packaged in plastic bags and in bulk silos. Eventually, the floor screed is moved out and transported to the construction site.

### TRANSPORT AND INSTALLATION (A4-A5)

Transportation impacts occurred from final products delivery to construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions.

The transportation distance is defined according to the PCR. Average distance of transportation from production plant to building site is assumed as 70 km and the transportation method is assumed to be lorry. Vehicle capacity utilization volume factor is assumed to be 100 % which means full load. In reality, it may vary but as role of transportation emissions in total results is small, the variety in load is assumed to be negligible. Empty returns are not taken into account as it is assumed that return trip is used by the transportation company to serve the needs of other clients. Transportation does not cause losses as product are packaged properly. Also, volume capacity utilisation factor is assumed to be 100 % for the nested packaged products.

The floor screed blend is mixed with water at the installation site and no material loss is assumed to happen during installation. The installation is done by machine and thus the energy consumption is deemed negligible. Since the average energy consumption per installed kg is under cut-off criteria 1%.

The plastic packaging are assumed to be incinerated.

### PRODUCT USE AND MAINTENANCE (B1-B7)

This EPD does not cover the use phase. Air, soil, and water impacts during the use phase have not been studied.

### PRODUCT END OF LIFE (C1-C4, D)

At the end-of-life, in the demolition phase 100% of the waste is assumed to be collected as mixed construction waste. The demolition process consumes energy in the form of diesel fuel used by building machines. Energy consumption of the demolition process is assumed to be 0.01 kWh/kg (C1).

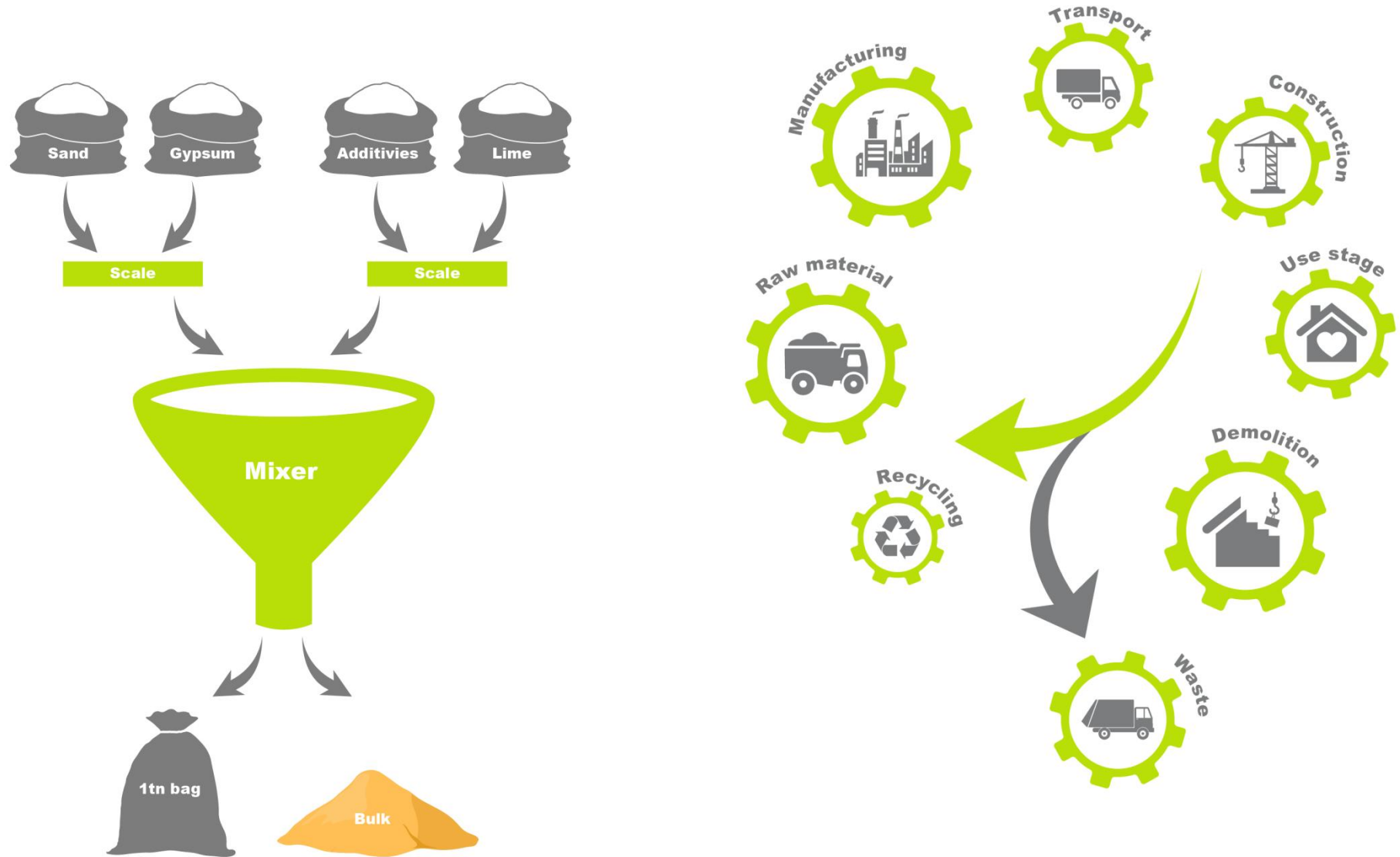
The demolished floor screed is delivered to the nearest construction waste treatment plant. It is estimated that there is no mass loss during the use of the product, therefore the end-of-life product is assumed that it has the same weight as the declared product. Transportation distance to the closest disposal area is estimated as 50 km and the transportation method is lorry which is the most common (C2).

At the waste treatment plant, waste that can be reused, recycled or recovered for energy is separated and diverted for further use. At the beginning of 2020 waste restrictions in Finland were tightened and the amount of waste going to landfill is restricted compared to the last years, so it can be assumed that 100% of screed is transported to a waste treatment plant. A realistic assumption is made about 20% of gypsum based floor screed being recycled. The process losses of the waste treatment plant are assumed to be negligible (C3). The remaining 80% of floor screed is sent to landfill (C4).

The recycled material content in the floor screed itself is assumed to be 0% (D).



# MANUFACTURING PROCESS



# LIFE-CYCLE ASSESSMENT

## LIFE-CYCLE ASSESSMENT INFORMATION

Period for data Calendar year 2020

## DECLARED AND FUNCTIONAL UNIT

Declared unit 1 kg

Mass per declared unit 1 kg

## BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C 0

Biogenic carbon content in packaging, kg C 0

## SYSTEM BOUNDARY

This EPD covers the *cradle to gate with options* scope with following modules; A1 (Raw material supply), A2 (Transport) and A3 (Manufacturing), A4 (Transport), A5 (Assembly) as well as C1 (Deconstruction), C2 (Transport at end-of-life), C3 (Waste processing) and C4 (Disposal). In addition, module D - benefits and loads beyond the system boundary is included.

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	
x	x	x	x	x	MND	MND	MND	MND	MND	MND	MND	x	x	x	x	x	x	x	
Geography, by two-letter ISO country code or regions. The International EPD System only.																			
EU	EU	EU	EU	EU	-	-	-	-	-	-	-	EU	EU	EU	EU			EU	
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Operational	Deconstr./demol.	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling

Modules not declared = MND. Modules not relevant = MNR.

## CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the EN 15804:2012+A2:2019 and the applied PCR. 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.

For easier modelling and because of lack of accuracy in available modelling resources, some constituents under 0,1% of product mass are excluded. These include some screed additives which are all present in the product only in very small amounts and have no serious impact on the emissions of the product.

The production of capital equipment is included. Construction activities, and infrastructure, maintenance and operation of capital equipment, personnel-related activities, energy and water use related to company management and sales activities are excluded.

## 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 values for 1 kilogram of floor screed are calculated by considering the total annual production. In the factory, several kinds of mortars and floor screeds are produced; since the production processes of these products are similar, the annual production percentages are taken into consideration for allocation. As the processes for all products produced at the factory are very similar regardless of the products formulation, raw

materials, energy consumption and waste streams are assumed to be the same for all types of products. Subsequently, the amounts for the flows were calculated by dividing the total inputs by the total output of the facility.

Allocation used in Ecoinvent 3.6 environmental data sources follows the methodology 'allocation, cut-off by classification'. This methodology is in line with the requirements of the EN 15804 -standard.

## AVERAGES AND VARIABILITY

There is no average result considered in this study since this EPD refers to one specific product produced in one production plant.

### The International EPD System additional data requirements

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

<b>Supply-chain specific data for GWP-GHG</b>	79,8% %
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## ENVIRONMENTAL IMPACT DATA

Note: additional environmental impact data may be presented in annexes.

### CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total	kg CO <sub>2</sub> e	3,13E-2	4,63E-2	3,09E-2	1,08E-1	6,31E-3	4,35E-4	MND	MND	MND	MND	MND	MND	MND	3,3E-3	4,81E-3	2,62E-3	4,46E-3	-1,27E-3
GWP – fossil	kg CO <sub>2</sub> e	3,09E-2	4,63E-2	2,87E-2	1,06E-1	6,37E-3	3,72E-4	MND	MND	MND	MND	MND	MND	MND	3,3E-3	4,8E-3	2,6E-3	4,45E-3	-1,26E-3
GWP – biogenic	kg CO <sub>2</sub> e	2,91E-4	3E-6	2,13E-3	2,42E-3	4,62E-6	6,29E-5	MND	MND	MND	MND	MND	MND	MND	9,17E-7	3,49E-6	1,78E-5	8,83E-6	-8,06E-8
GWP – LULUC	kg CO <sub>2</sub> e	2,13E-5	2,42E-5	3,24E-6	4,87E-5	1,92E-6	2,77E-7	MND	MND	MND	MND	MND	MND	MND	2,79E-7	1,45E-6	1,53E-6	1,32E-6	-1,42E-6
Ozone depletion pot.	kg CFC-11e	2,73E-9	9,85E-9	3,52E-9	1,61E-8	1,5E-9	2,86E-11	MND	MND	MND	MND	MND	MND	MND	7,12E-10	1,13E-9	5,93E-10	1,83E-9	-7,31E-10
Acidification potential	mol H <sup>+</sup> e	1,76E-4	1,11E-3	1,35E-4	1,43E-3	2,67E-5	1,24E-6	MND	MND	MND	MND	MND	MND	MND	3,45E-5	2,02E-5	2,17E-5	4,23E-5	-2,53E-5
EP-freshwater <sup>2)</sup>	kg Pe	9,4E-7	2,52E-7	4,69E-7	1,66E-6	5,18E-8	9,95E-9	MND	MND	MND	MND	MND	MND	MND	1,33E-8	3,91E-8	6,28E-8	5,38E-8	-2,78E-8
EP-marine	kg Ne	3,59E-5	2,79E-4	3,31E-5	3,48E-4	8,06E-6	3,05E-7	MND	MND	MND	MND	MND	MND	MND	1,52E-5	6,08E-6	7,93E-6	1,45E-5	-7,97E-6
EP-terrestrial	mol Ne	4,29E-4	3,1E-3	3,53E-4	3,88E-3	8,9E-5	3,36E-6	MND	MND	MND	MND	MND	MND	MND	1,67E-4	6,71E-5	8,75E-5	1,6E-4	-1E-4
POCP (“smog”)	kg NMVOCe	1,15E-4	8,13E-4	1,03E-4	1,03E-3	2,86E-5	1,08E-6	MND	MND	MND	MND	MND	MND	MND	4,59E-5	2,16E-5	2,45E-5	4,65E-5	-2,52E-5
ADP-minerals & metals	kg Sbe	1,15E-5	4,59E-7	5,3E-8	1,2E-5	1,09E-7	5,58E-9	MND	MND	MND	MND	MND	MND	MND	5,03E-9	8,19E-8	2,53E-8	4,07E-8	-7,67E-6
ADP-fossil resources	MJ	4,04E-1	6,35E-1	5,81E-1	1,62E0	9,9E-2	4,09E-3	MND	MND	MND	MND	MND	MND	MND	4,54E-2	7,47E-2	4,69E-2	1,24E-1	-5,49E-2
Water use <sup>3)</sup>	m <sup>3</sup> e depr.	4,27E-2	1,61E-3	2,62E-2	7,06E-2	3,68E-4	3,57E-3	MND	MND	MND	MND	MND	MND	MND	8,46E-5	2,78E-4	1,02E-3	5,75E-3	-3,82E-4

1) GWP = Global Warming Potential; EP = Eutrophication potential; POCP = Photochemical ozone formation; ADP = Abiotic depletion potential. 2) 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 experienced with the indicator. 3) Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO<sub>4</sub>e.



## ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter	Incidence	2,14E-9	2,22E-9	1,29E-9	5,65E-9	5,76E-10	1,85E-11	MND	MND	MND	MND	MND	MND	MND	9,14E-10	4,34E-10	1,27E-9	8,21E-10	-3,43E-10
Ionizing radiation <sup>3)</sup>	kBq U235e	1,05E-3	2,74E-3	1,2E-2	1,58E-2	4,33E-4	1,63E-5	MND	MND	MND	MND	MND	MND	MND	1,94E-4	3,26E-4	2,26E-4	5,11E-4	-1,22E-4
Ecotoxicity (freshwater)	CTUe	1,49E0	4,22E-1	3,9E-1	2,3E0	7,57E-2	4,31E-3	MND	MND	MND	MND	MND	MND	MND	2,66E-2	5,71E-2	3,29E-2	7,86E-2	-4,93E-1
Human toxicity, cancer	CTUh	9,87E-12	2,13E-11	7,3E-12	3,84E-11	1,94E-12	4,87E-13	MND	MND	MND	MND	MND	MND	MND	9,53E-13	1,46E-12	1,23E-12	1,86E-12	-1,37E-12
Human tox. non-cancer	CTUh	2,79E-10	4E-10	1,37E-10	8,16E-10	8,97E-11	8,17E-12	MND	MND	MND	MND	MND	MND	MND	2,35E-11	6,76E-11	2,99E-11	5,74E-11	-2,87E-11
SQP	-	2,56E-1	3,43E-1	2,22E-2	6,22E-1	1,5E-1	2,02E-3	MND	MND	MND	MND	MND	MND	MND	1,16E-3	1,13E-1	7,8E-2	2,12E-1	-2,73E-2

4) SQP = Land use related impacts/soil quality.5) 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.

## USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy	MJ	2,51E-2	5,38E-3	1,24E-2	4,29E-2	1,25E-3	2,86E-4	MND	MND	MND	MND	MND	MND	MND	2,45E-4	9,4E-4	1,92E-3	1,01E-3	-5,64E-4
Total use of renew. PER	MJ	2,51E-2	5,38E-3	1,24E-2	4,29E-2	1,25E-3	2,86E-4	MND	MND	MND	MND	MND	MND	MND	2,45E-4	9,4E-4	1,92E-3	1,01E-3	-5,64E-4
Non-re. PER as energy	MJ	4,04E-1	6,35E-1	5,41E-1	1,58E0	9,9E-2	4,09E-3	MND	MND	MND	MND	MND	MND	MND	4,54E-2	7,47E-2	4,69E-2	1,24E-1	-5,49E-2
Non-re. PER as material	MJ	0E0	0E0	4E-2	4E-2	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Total use of non-re. PER	MJ	4,04E-1	6,35E-1	5,81E-1	1,62E0	9,9E-2	4,09E-3	MND	MND	MND	MND	MND	MND	MND	4,54E-2	7,47E-2	4,69E-2	1,24E-1	-5,49E-2
Secondary materials	kg	0E0	0E0	1,1E-5	1,1E-5	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Use of net fresh water	m <sup>3</sup>	1,31E-3	8,34E-5	3,16E-4	1,71E-3	2,06E-5	2E-4	MND	MND	MND	MND	MND	MND	MND	4,01E-6	1,55E-5	2,69E-5	1,36E-4	-1,05E-5

6) PER = Primary energy resources

## END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	1,36E-3	6,63E-4	5,56E-4	2,58E-3	9,62E-5	2,25E-5	MND	MND	MND	MND	MND	MND	MND	4,88E-5	7,26E-5	0E0	1,16E-4	-4,52E-5
Non-hazardous waste	kg	4,14E-2	2,93E-2	2,46E-2	9,53E-2	1,06E-2	6,39E-4	MND	MND	MND	MND	MND	MND	MND	5,22E-4	8,03E-3	0E0	8,45E-1	-1,43E-3
Radioactive waste	kg	1,02E-6	4,43E-6	5,63E-6	1,11E-5	6,8E-7	1,72E-8	MND	MND	MND	MND	MND	MND	MND	3,18E-7	5,13E-7	0E0	8,23E-7	-1,84E-7

## ENVIRONMENTAL IMPACTS – GWP-GHG - THE INTERNATIONAL EPD SYSTEM

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG	kg CO <sub>2</sub> e	3,09E-2	4,63E-2	2,87E-2	1,06E-1	6,37E-3	3,72E-4	MND	MND	MND	MND	MND	MND	MND	3,3E-3	4,8E-3	2,6E-3	4,45E-3	-1,26E-3

8) 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) This indicator is almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

## SCENARIO DOCUMENTATION

### Manufacturing energy scenario documentation

Scenario parameter	Value
Electricity data source and quality	Electricity, Finland, residual mix, IEA, 2019
Electricity CO <sub>2e</sub> / kWh	0.45

## 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 v3.6 (2019).

EN 15804:2012+A2:2019 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 1.11 (05.02.2021)

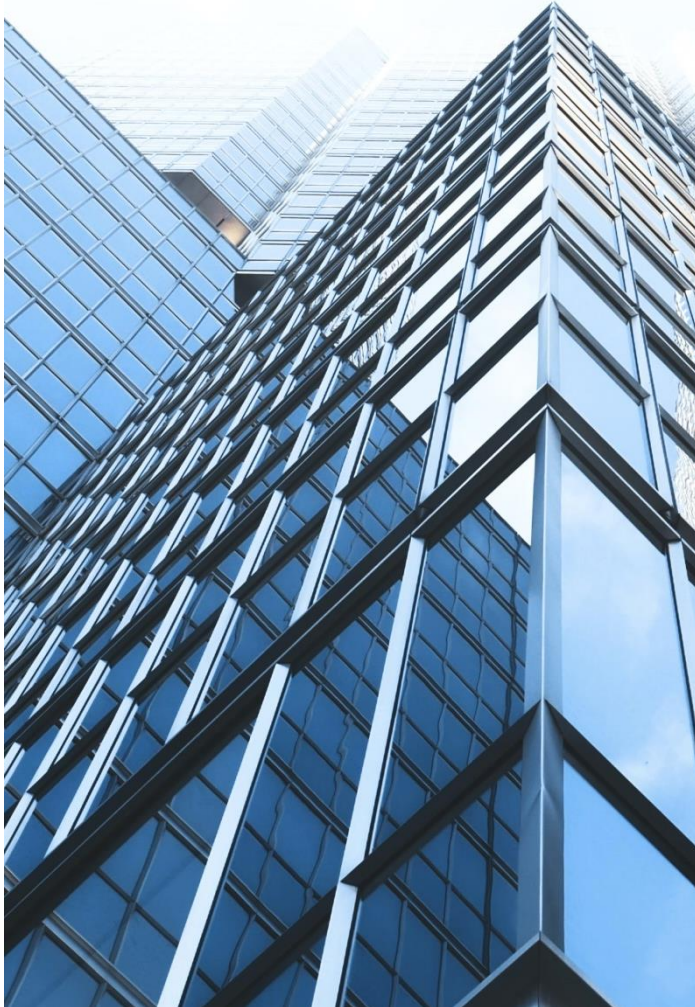
General Programme Instructions of the international EPD® system. Version 4.0

## ABOUT THE MANUFACTURER

Fescon is a leading Finnish company producing dry products for the construction industry. Our main products are dry mortars and concretes, repair mortars and lime-cement mortars, wall and floor levelling mortars, facade coatings and paints and products for tiling and waterproofing.

## EPD AUTHOR AND CONTRIBUTORS

<b>Manufacturer</b>	Fescon Oy
<b>EPD author</b>	Oskar Leinonen, Fescon Oy
<b>EPD verifier</b>	Anni Oviir, Rangi Maja OÜ, <a href="http://www.lcasupport.com">www.lcasupport.com</a>
<b>EPD program operator</b>	The International EPD System
<b>Background data</b>	This EPD is based on Ecoinvent 3.6 (cut-off) and One Click LCA databases.
<b>LCA software</b>	The LCA and EPD have been created using One Click LCA Pre-Verified EPD Generator for Gypsum and Limestone Products



# VERIFICATION STATEMENT

## VERIFICATION PROCESS FOR THIS EPD

This EPD has been verified in accordance with ISO 14025 by an independent, third-party verifier by reviewing results, documents and compliancy with EN 15804, ISO 14025 and ISO 14040/14044, following the process and checklists of the program operator for:

- This Environmental Product Declaration
- The Life-Cycle Assessment used in this EPD
- The background report (project report) for this EPD

Why does verification transparency matter? [Read more online.](#)

## VERIFICATION OVERVIEW

Following independent third party has verified this specific EPD:

EPD verification information	Answer
Independent EPD verifier	Anni Oviir, Rangi Maja OÜ, <a href="http://www.lcasupport.com">www.lcasupport.com</a>
EPD verification started on	2022-01-07
EPD verification completed on	2022-05-18
Supply-chain specific data %	79,8%
Approver of the EPD verifier	The International EPD System

Author & tool verification	Answer
EPD author	Oskar Leinonen, Fescon Oy
EPD author training completion	2021-08-10
EPD Generator module	Gypsum and Limestone Products

Independent software verifier	Ugo Pretato, Studio Fieschi & soci Srl.
Software verification date	2021-05-11

## THIRD-PARTY VERIFICATION STATEMENT

I hereby confirm that, following detailed examination, I have not established any relevant deviations by the studied Environmental Product Declaration (EPD), its LCA and project report, in terms of

- the data collected and used in the LCA calculations,
- the way the LCA-based calculations have been carried out,
- the presentation of environmental data in the EPD, and
- other additional environmental information, as present

with respect to the procedural and methodological requirements in ISO 14025:2010 and EN 15804:2012+A2:2019.

I confirm that the company-specific data has been examined as regards plausibility and consistency; the declaration owner is responsible for its factual integrity and legal compliance.

I confirm that I have sufficient knowledge and experience of construction products, this specific product category, the construction industry, relevant standards, and the geographical area of the EPD to carry out this verification.

I confirm my independence in my role as verifier; I have not been involved in the execution of the LCA or in the development of the declaration and have no conflicts of interest regarding this verification.

Anni Oviir





# VERIFICATION AND REGISTRATION (ENVIRONDEC)

ISO standard ISO 21930 and CEN standard EN 15804 serves as the core Product Category Rules (PCR)	
PCR	PCR 2019:14 Construction products, version 1.11
PCR review was conducted by:	The Technical Committee of the International EPD® System. See <a href="http://www.environdec.com/TC">www.environdec.com/TC</a> for a list of members. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat <a href="http://www.environdec.com/contact">www.environdec.com/contact</a> .
Independent third-party verification of the declaration and data, according to ISO 14025:2006:	<b>Independent verification of this EPD and data, according to ISO 14025:</b> <input type="checkbox"/> Internal certification <input checked="" type="checkbox"/> External verification
Third party verifier	Anni Oviir, Rangi Maja OÜ, <a href="http://www.lcasupport.com">www.lcasupport.com</a>
	Approved by: The International EPD® System Technical Committee, supported by the Secretariat
Procedure for follow-up during EPD validity involves third party verifier	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no



EPD International AB, Box 210 60, SE-100 31 Stockholm, Sweden, E-mail: [info@environdec.com](mailto:info@environdec.com)

## ANNEX 1 : ENVIRONMENTAL IMPACTS – EN 15804+A1, CML / ISO 21930

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Pot.	kg CO <sub>2</sub> e	3E-2	4,6E-2	2,89E-2	1,05E-1	6,31E-3	3,63E-4	MND	MND	MND	MND	MND	MND	MND	3,27E-3	4,76E-3	2,57E-3	4,37E-3	-1,15E-3
Ozone depletion Pot.	kg CFC <sub>11</sub> e	2,23E-9	7,81E-9	2,8E-9	1,28E-8	1,19E-9	2,53E-11	MND	MND	MND	MND	MND	MND	MND	5,63E-10	8,97E-10	4,84E-10	1,45E-9	-5,65E-10
Acidification	kg SO <sub>2</sub> e	1,31E-4	8,77E-4	9,25E-5	1,1E-3	1,3E-5	8,42E-7	MND	MND	MND	MND	MND	MND	MND	4,87E-6	9,77E-6	6,05E-5	1,76E-5	-1,47E-5
Eutrophication	kg PO <sub>4</sub> <sup>3</sup> e	3,59E-5	1,01E-4	2,48E-5	1,62E-4	2,62E-6	8,01E-7	MND	MND	MND	MND	MND	MND	MND	8,57E-7	1,97E-6	2,95E-6	3,41E-6	-2,88E-6
POCP ("smog")	kg C <sub>2</sub> H <sub>4</sub> e	6,42E-6	2,35E-5	4,4E-6	3,43E-5	8,21E-7	7,16E-8	MND	MND	MND	MND	MND	MND	MND	5,01E-7	6,19E-7	5,01E-7	1,29E-6	-6,37E-7
ADP-elements	kg Sbe	1,15E-5	4,59E-7	5,3E-8	1,2E-5	1,09E-7	5,58E-9	MND	MND	MND	MND	MND	MND	MND	5,03E-9	8,19E-8	2,53E-8	4,07E-8	-7,67E-6
ADP-fossil	MJ	4,04E-1	6,35E-1	5,81E-1	1,62E0	9,9E-2	4,09E-3	MND	MND	MND	MND	MND	MND	MND	4,54E-2	7,47E-2	4,69E-2	1,24E-1	-5,49E-2