

Environmental Product Declaration



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

DG-M5 HILO mortar

from

Dan-Grit 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

Programme information

Programme:	The International EPD [®] System
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CEN standard EN 15804:2012 +A2(2019) serves as the Core Product Category Rules (PCR)	
Product category rules (PCR): PCR 2019:14-c-PCR-001 Cement and building lime (EN 16908) (2022-05-18) and PCR 2019:14 Construction products (EN 15804:A2) (1.2.5)	
PCR review was conducted by: <i>The Technical Committee of the International EPD[®] System.</i> Claudia A. Peña. Contact via info@environdec.com	
Independent third-party verification of the declaration and data, according to ISO 14025:2006: <input type="checkbox"/> EPD process certification <input checked="" type="checkbox"/> EPD verification	
Third-party verifier: <i>Vladimír Kočí, LCA Studio, Czech Republic</i>	 
Approved by: The International EPD [®] System	
Procedure for follow-up of data during EPD validity involves third party verifier: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	

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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. For further information about comparability, see EN 15804 and ISO 14025.

Company information

Owner of the EPD: Dan-Grit A/S

Contact: Maibrith Andersen, Maj@dan-grit.dk

Description of the organisation: Dan-Grit is headquartered in Alslev, where we produce dry mortar, water scouring and dry concrete, wet mortar and cement. The mortar is dry – you only have to add water before use.

Product-related or management system-related certifications: Certified to EN/DS 998-2

Name and location of production site(s): Dan-Grit A/S, Alslev, 6800 Varde, Denmark

Product information

Product name: DG-M5 HILO; DG-M5 m/HC HILO; DG-M5 indf HILO. The total results of the core indicators are within 10% and therefore an average result is reported.

Product identification: UN CPC code 37440 - Portland cement, aluminous cement, slag cement and similar hydraulic cements except in the form of clinkers

Product description: Dan-Grit A/S - DG-M5 family of functional mortars are used to build brick walls. It has a compressive strength >5 MPa.

LCA information

Functional unit / declared unit:

The declared unit in this LCA study is 1 kg dry mortar as it leaves the factory gate. When mixed with water, this makes approximately 1.1 kg of mortar.

Reference service life:

50 years

Time representativeness:

The site specific data used for the product manufacturing corresponds to 2021.

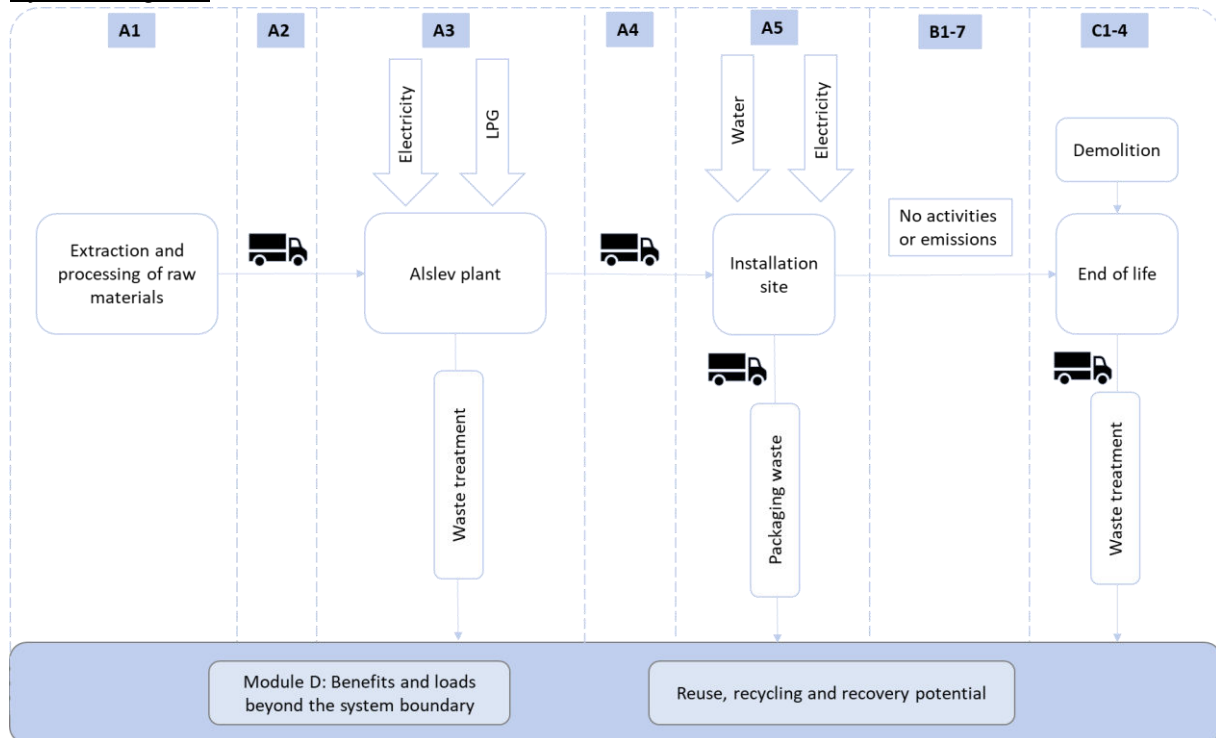
Database(s) and LCA software used:

GaBi v.10.6.2.9 with an integrated Ecoinvent database v.3.8

Description of system boundaries:

Cradle to grave and module D (A + B + C + D)

System diagram:



More information:

A1, raw material supply

This module considers the extraction and processing of all raw materials, energy, and transportation which occur upstream to the studied manufacturing process, including packaging material. Products can be packaged in big bags and 25kg sacks, so an average packaging option was chosen.

A2, transport to the manufacturer

The raw materials are transported to the manufacturing site. This also includes packaging material.

A3, manufacturing

This module includes manufacturing of the mortar products at Dan-Grit's factory. No co-products are produced, so no allocation required.

A4, Transport

Transportation from Dan Grit A/S to the Danish building sites is taken into account.

A5, Construction installation

This stage includes any resources used during the installation of the product on the construction site. Treatment of the packaging waste on-site is considered. Danish average data was used for waste treatment.

B1-B7

This stage includes no activities or emissions related to the product.

C1 Deconstruction/Demolition

This stage includes the de-construction and/or demolition of the building.

C2 Transport

Transport distance to waste processing.

C3 Waste processing

This stage includes any waste treatment needed. It reflects Danish average treatment of mixed construction waste, where 93% is recycled, 3% incinerated with energy recovery and 4% sent to landfill.

C4 Final disposal

This includes any material that is landfilled.

D Benefits and loads beyond the system boundary

Emission credits are obtained from energy recovery and recycling of waste materials. It was assumed that the product was reused as filler material in new construction projects, replacing crushed rock. In energy recovery, it is assumed that heat and electricity from waste incineration substitute thermal energy from natural gas and average Danish electricity grid mix, respectively.

Omissions of life cycle stages

The following flows were excluded from the system boundary:

- A1-A3: The plants, production of machines and transportation systems are excluded since the related flows are supposed to be negligible compared to the potential environmental impacts through the life cycle of the product.

In addition, the following flows are excluded from the system boundaries:

- Flows related to human activities, such as employee transport.

Cut-off criteria

The following procedures were followed for the exclusion of inputs and output.

- All input and output flows in a unit process were considered i.e., taking into account the value of all flows in the unit process and the corresponding LCI where data was available.
- Data gaps were filled by conservative assumptions with average or generic data. Any assumptions in such cases were documented.
- The use of cut-off criterion on mass inputs and primary energy at the unit process level (1%) and at the information module level (5%).

All hazardous and toxic materials and substances are included in the inventory and the cut-off rules do not apply.

Time representativeness

The site specific data used for the product manufacturing corresponds to 2021. The age of data from generic databases varies mainly from 2017 – 2021. Incineration of inert material (2006) was older than this. It has negligible impact on all core indicators except ozone depletion potential. It was investigated, but no better datasets could be obtained.

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

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage	
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential	
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	
Modules declared	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Geography	EU	DK	DK	DK	DK	DK	DK	DK	DK	DK	DK	DK	DK	DK	DK	DK	DK	
Specific data used	Factory supplied specific data for A3					-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	5 %					-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	0 %					-	-	-	-	-	-	-	-	-	-	-	-	-

Content information

Product components	Weight, kg	Post-consumer material, weight-%	Renewable material, weight-%
Sand	0.7 – 0.9	0	0
Cement	0.05 – 0.15	0	0
Calcium carbonate	0.01 – 0.10	0	0
Additives	< 0.01	0	0
TOTAL	1		
Packaging materials	Weight, kg	Weight-% (versus the product)	
Pallet	2.60E-05	2.6E-03	
Plastic bags	4.18E-08	4.18E-06	
Plastic wrap	2.95E-09	2.95E-07	
Big bags	1.13E-07	1.13E-05	
TOTAL	2.62E-05	2.62E-03	

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.

Environmental Information

Potential environmental impact – mandatory indicators according to EN 15804

Results per functional unit: 1kg										
Indicator	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
GWP - total	kg CO ₂ eq.	9.45E-02	1.09E-02	1.88E-03	0	6.97E-04	7.22E-03	5.08E-03	6.34E-04	-2.31E-02
GWP-fossil	kg CO ₂ eq.	1.36E-01	1.09E-02	1.47E-03	0	7.30E-04	7.19E-03	4.73E-03	6.52E-04	-2.34E-02
GWP-biogenic	kg CO ₂ eq.	-4.13E-02	-1.51E-05	4.13E-04	0	-3.76E-05	-9.87E-06	3.44E-04	-1.93E-05	3.72E-04
GWP-luluc	kg CO ₂ eq.	5.40E-05	6.08E-05	5.60E-07	0	4.74E-06	3.98E-05	1.35E-05	1.20E-06	-1.58E-05
ODP	kg CFC 11 eq.	1.76E-13	6.53E-16	2.51E-14	0	6.91E-17	4.28E-16	7.06E-11	1.53E-15	-2.97E-14
AP	mol H ⁺ eq.	2.34E-04	1.00E-05	2.31E-06	0	3.54E-06	1.16E-05	2.16E-05	4.62E-06	-2.67E-05
EP-freshwater	kg PO ₄ ³⁻ eq.	2.89E-05	1.45E-06	3.89E-07	0	5.85E-07	1.84E-06	3.53E-06	4.11E-07	-3.69E-06
EP-freshwater	kg P eq.	7.49E-08	3.25E-08	9.74E-09	0	2.51E-09	2.13E-08	8.64E-09	1.10E-09	-1.24E-08
EP- marine	kg N eq.	8.26E-05	3.05E-06	7.89E-07	0	1.65E-06	4.64E-06	1.01E-05	1.18E-06	-9.83E-06
EP-terrestrial	mol N eq.	9.06E-04	3.67E-05	7.67E-06	0	1.83E-05	5.31E-05	1.11E-04	1.30E-05	-1.13E-04
POCP	kg NMVOC eq.	2.50E-04	8.67E-06	1.88E-06	0	4.63E-06	1.04E-05	2.73E-05	3.59E-06	-2.74E-05
ADP-minerals&metals*	kg Sb eq.	5.69E-09	9.11E-10	7.62E-10	0	7.09E-11	5.97E-10	3.23E-09	6.68E-11	-1.41E-09
ADP-fossil*	MJ	1.03E+00	1.46E-01	1.75E-02	0	9.23E-03	9.55E-02	7.72E-02	8.54E-03	-3.87E-01
WDP	m ³	5.74E-03	9.78E-05	6.81E-04	0	7.87E-06	6.41E-05	4.45E-03	7.15E-05	-3.03E-03
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption									

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

Potential environmental impact – additional mandatory and voluntary indicators

Results per functional unit: 1kg										
Indicator	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
GWP-GHG ¹	kg CO ₂ eq.	9.04E+00	5.01E-02	2.51E-02	0	3.91E-03	3.29E-02	1.29E-02	1.78E-03	-1.05E-01

Use of resources

Results per functional unit: 1kg										
Indicator	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
PERE	MJ	5.63E-02	8.28E-03	3.64E-02	0	6.40E-04	5.43E-03	3.77E-03	1.28E-03	-9.68E-03
PERM	MJ	5.20E-01	0	0	0	0	0	0	0	0
PERT	MJ	5.76E-01	8.28E-03	3.64E-02	0	6.40E-04	5.43E-03	3.77E-03	1.28E-03	-9.68E-03
PENRE	MJ	1.02E+00	1.46E-01	1.75E-02	0	9.27E-03	9.57E-02	7.73E-02	8.55E-03	-3.87E-01
PENRM	MJ.	7.32E-03	0	0	0	0	0	0	0	0
PENRT	MJ	1.03E+00	1.46E-01	1.75E-02	0	9.27E-03	9.57E-02	7.73E-02	8.55E-03	-3.87E-01
SM	kg	0	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0
FW	m ³	1.93E-04	9.37E-06	1.39E-04	0	7.39E-07	6.14E-06	1.06E-04	2.17E-06	-7.95E-05
Acronyms	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water									

¹ 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 almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

Waste production and output flows

Waste production

Results per functional unit: 1kg										
Indicator	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Hazardous waste disposed	kg	8.63E-11	6.99E-13	4.19E-12	0	4.90E-14	4.58E-13	7.14E-13	4.39E-13	-5.61E-11
Non-hazardous waste disposed	kg	1.81E-02	2.09E-05	1.08E-04	0	1.51E-06	1.37E-05	1.51E-05	4.37E-02	-8.27E-05
Radioactive waste disposed	kg	3.28E-05	1.80E-07	1.44E-06	0	1.72E-08	1.18E-07	1.90E-06	9.50E-08	-9.20E-06

Output flows

Results per functional unit: 1kg										
Indicator	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Components for re-use	kg	0	0	0	0	0	0	0	0	0
Material for recycling	kg	0	0	1.20E-04	0	0	0	1.02E+00	0	0
Materials for energy recovery	kg	0	0	0	0	0	0	3.28E-02	0	0
Exported energy, electricity	MJ	0	0	0	0	0	0	0	0	0
Exported energy, thermal	MJ	0	0	0	0	0	0	0	0	0

Information on biogenic carbon content





Results per functional unit: 1kg		
BIOGENIC CARBON CONTENT	Unit	QUANTITY
Biogenic carbon content in product	kg C	0
Biogenic carbon content in packaging	kg C	3.67E-04

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO₂.

References

Association of Issuing Bodies (2022)	European Residual Mixes 2021
Construction and Demolition Recycling Association	https://www.cdrecycling.org/materials/concrete/ Accessed 2022-07-20
cPCR-001 (2022)	c-PCR Cement and building lime
EN 15804:2012+A2:2019	Sustainability of construction works – Environmental product declaration – Core rules for the product category of constructions products
EPD International (2021)	General Programme Instructions of the International EPD® System, version 4.0
ISO 14025:2006	International Standard ISO 14025 – Environmental labels and declarations — Type III environmental declarations — Principles and procedures
ISO 14040:2006	International Standard ISO 14040: Environmental Management – Life cycle assessment – Principles and framework. Second edition 2006-07-01.
ISO 14044:2006	International Standard ISO 14044: Environmental Management – Life cycle assessment – Requirements and Guidelines.
Material Properties	https://material-properties.org/diesel-fuel-density-melting-point-thermal-conductivity/ Accessed 2022-07-13
Nearby Engineers (2019)	https://www.ny-engineers.com/blog/recycling-and-reusing-concrete Accessed 2022-07-20
PCR 2019:14	PCR 2019:14 Construction products (EN 15804:A2) (1.2.5)
Statistics Denmark	https://www.statbank.dk/statbank5a/SelectVarVal/saveselections.asp Accessed 2022-12-13

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