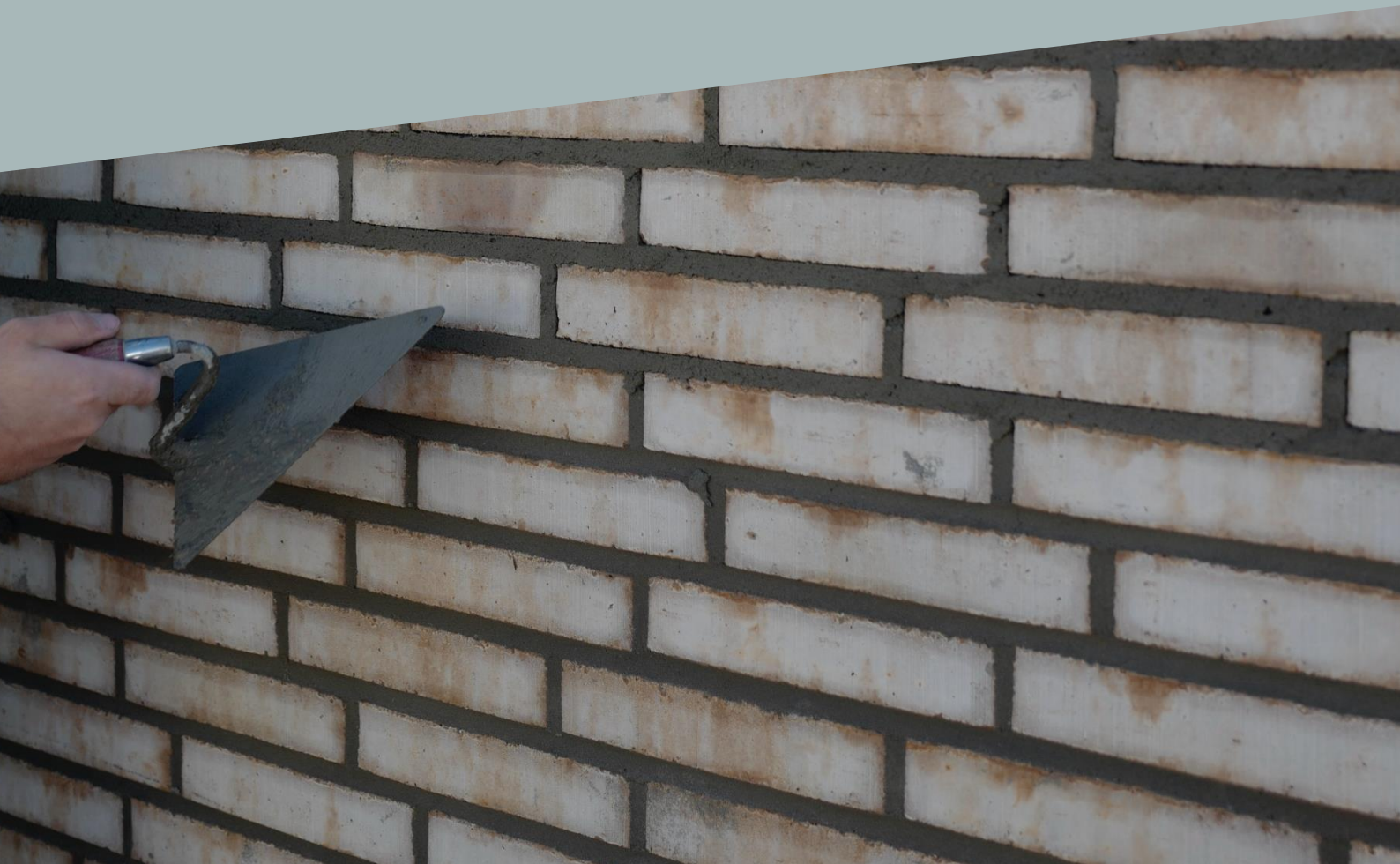


Owner: Marlon Tørmørtel A/S
No.: MD-23067-EN
Issued: 24-02-2023
Valid to: 24-02-2028

3rd PARTY VERIFIED

EPD

VERIFIED ENVIRONMENTAL PRODUCT DECLARATION | ISO 14025 & EN 15804



Owner of declaration

Marlon Tørmørtel A/S
Virkelyst 20, 8740 Brædstrup
VAT no. 13254079


Issued:

24-02-2023

Valid to:

24-02-2028

Programme

EPD Danmark
www.epddanmark.dk



- Industry EPD
 Product EPD

Basis of calculation

This EPD is developed in accordance with the European standard EN 15804+A2.

Comparability

EPDs of construction products may not be comparable if they do not comply with the requirements in EN 15804. EPD data may not be comparable if the datasets used are not developed in accordance with EN 15804 and if the background systems are not based on the same database.

Validity

This EPD has been verified in accordance with ISO 14025 and is valid for 5 years from the date of issue.

Use

The intended use of an EPD is to communicate scientifically based environmental information for construction products, for the purpose of assessing the environmental performance of buildings.

Declared product(s)

Funktionsmørtel M5
Funktionsmørtel M5 Grå/hvid S200
Funktionsmørtel HM M5 Grå 100
Funktionsmørtel M5 HM
Funktionsmørtel HM M5 Grå/hvid S200
Funktionsmørtel M5 Grå S601
Funktionsmørtel HM M5 Grå 601
Funktionsmørtel M5 Grå S603
Funktionsmørtel M5 Antrac S607

Number of declared datasets/product variations: 9

EPD type

- Cradle-to-gate with modules C1-C4 and D
 Cradle-to-gate with options, modules C1-C4 and D
 Cradle-to-grave and module D
 Cradle-to-gate
 Cradle-to-gate with options

Production site

Marlon Tørmørtel A/S, Virkelyst 20, 8740 Brædstrup

Product(s) use

Masonry and plastering mortar

Declared/ functional unit

The declared unit is 1 kg dry mortar

Year of data

2020

CEN standard EN 15804 serves as the core PCR

Independent verification of the declaration and data, according to EN ISO 14025

- internal external

Third party verifier:



Guangli Du



Martha Katrine Sørensen
EPD Danmark

Life cycle stages and modules (MND = module not declared)

Product			Construction process		Use								End of life				Beyond the system boundary
Raw material supply	Transport	Manufacturing	Transport	Installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Re-use, recovery and recycling potential	
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	
X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X	

Product information

Product description

The general composition of the products is shown in the table below. These values, declared as mass-% are characteristics to all the dry-mortars for which this document is valid. Specific recipes and some minor components are not shown due to confidentiality.

Material	Weight-% of declared product
Cement	0 - 20%
Fillers	0 - 15%
Sand	70 - 90%
Pozzolanic materials	0 - 15%
Additives	0 - 10%

Representativity

This declaration, including data collection and the modelled foreground system including results, represents the production of nine Funktionsmørtel M5 variants on the production site located in Brædstrup, Denmark. Product specific data are based on average values collected in the period 2020. Background data are based on GaBi Professional 2021 and ecoinvent 3.7 databases and are less than 10 years old. Generally, the used background datasets are of high quality, and the majority of the datasets are only a couple of years old.

Picture of product(s)



Hazardous substances

The products do not contain substances listed in the "Candidate List of Substances of Very High Concern for authorisation"

(<http://echa.europa.eu/candidate-list-table>)

Essential characteristics

Funktionsmørtel M5 are covered by harmonised technical specification DS/EN 998-2. Declaration of performance according to EU regulation 305/2011 is available for all declared product variations.

Further technical information can be obtained by contacting the manufacturer or on the manufacturer's website:

<https://marlon.dk/>

Reference Service Life (RSL)

RSL of Funktionsmørtel M5 is defined as 50 years according to Annex A in DS/EN 16757:2022 – "Sustainability of construction works – Environmental product declarations – Product Category Rules for concrete and concrete element".

LCA background

Declared unit

The LCI and LCIA results in this EPD relates to the declared unit of 1 kg dry mortar as stated in the table below.

Name	Value	Unit
Declared unit	1	kg
Density	1800	kg/m ³
Conversion factor to 1 kg.	1	-

Functional unit

Not defined.

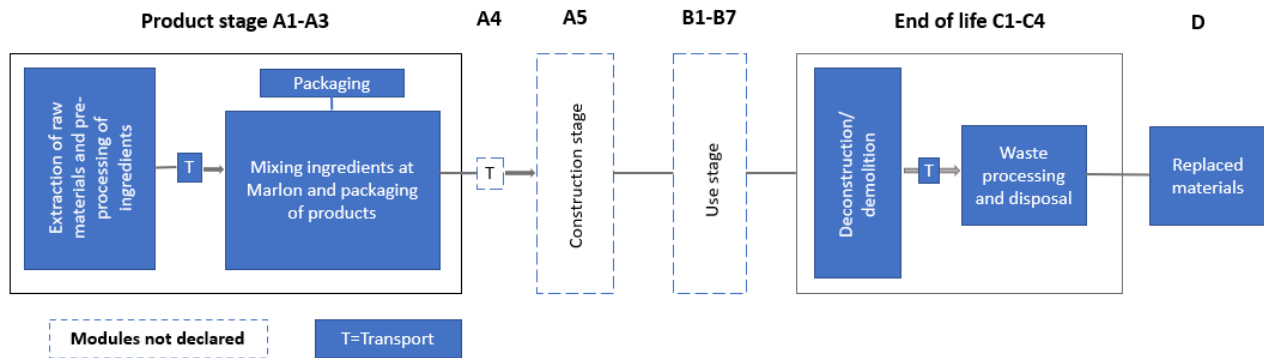
PCR

This EPD is developed according to the core rules for the product category of construction products in EN 15804+A2:2019, and EN 16757:2022 "Sustainability of construction works – Environmental product declarations – Product Category Rules for concrete and concrete elements"

Guarantee of Origin – certificates

No Guarantee of Origin certificates are used.

Flowdiagram



System boundary

This EPD is based on a “Cradle to gate with options, modules C1–C4, and module D” LCA, in which 100 weight-% has been accounted for.

The general rules for the exclusion of inputs and outputs follows the requirements in EN 15804+A2:2019, 6.3.5, where the total of neglected input flows per module shall be a maximum of 5% of energy usage and mass and 1% of energy usage and mass for unit processes.

Product stage (A1-A3) includes:

A1 – Extraction and processing of raw materials

A2 – Transport to the production site

A3 – Manufacturing processes

The product stage comprises the acquisition of all raw materials, products and energy, transport to the production site, packaging and waste processing up to the “end-of-waste” state or final disposal. The LCA results are declared in aggregated form for the product stage, which means, that the sub-modules A1, A2 and A3 are declared as one module A1-A3.

The raw materials for each batch accurately and transported to the blender, which mixes the final product in a predefined period.

Next, the mix is filled in bags, big bags, or bulk transport.

End of Life (C1-C4) includes:

At the end-of-life concrete structures are demolished and the concrete is excavated. From the deconstruction site, the concrete is transported to the waste processing site where it is crushed to gravel size. This EPD assumes that 97% of the crushed concrete is recycled and the remaining 3% is disposed in landfill.

Re-use, recovery and recycling potential (D) includes:

This covers the crushed concrete being used as road filling as a substitution for gravel.

LCA results

A sensitivity assessment comparing the separate environmental impacts for the products included in the product groups show that the results are almost identical. The difference is <7% for all environmental indicators and around 6% on GWP. Therefore, it can be justified that the products can be grouped as a product family.

ENVIRONMENTAL IMPACTS PER KG										
Parameter	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
GWP-total	[kg CO ₂ eq.]	1,64E-01	0,00E+00	0,00E+00	0,00E+00	1,05E-03	6,84E-03	9,09E-04	4,42E-04	-2,05E-03
GWP-fossil	[kg CO ₂ eq.]	1,63E-01	0,00E+00	0,00E+00	0,00E+00	1,21E-03	6,79E-03	1,02E-03	4,54E-04	-2,08E-03
GWP-biogenic	[kg CO ₂ eq.]	3,48E-04	0,00E+00	0,00E+00	0,00E+00	-1,97E-04	-8,11E-06	-1,40E-04	-1,32E-05	3,72E-05
GWP-luluc	[kg CO ₂ eq.]	1,06E-04	0,00E+00	0,00E+00	0,00E+00	3,57E-05	5,57E-05	2,55E-05	1,33E-06	-8,68E-06
ODP	[kg CFC 11 eq.]	6,85E-16	0,00E+00	0,00E+00	0,00E+00	8,61E-19	1,35E-18	6,15E-19	1,76E-18	-1,98E-17
AP	[mol H ⁺ eq.]	3,02E-04	0,00E+00	0,00E+00	0,00E+00	5,76E-06	7,82E-06	4,88E-06	3,23E-06	-1,42E-05
EP-freshwater	[kg P eq.]	1,31E-07	0,00E+00	0,00E+00	0,00E+00	1,30E-08	2,02E-08	9,26E-09	7,62E-10	-8,66E-09
EP-marine	[kg N eq.]	1,09E-04	0,00E+00	0,00E+00	0,00E+00	2,06E-06	2,61E-06	1,86E-06	8,39E-07	-5,67E-06
EP-terrestrial	[mol N eq.]	1,18E-03	0,00E+00	0,00E+00	0,00E+00	2,38E-05	3,08E-05	2,12E-05	9,22E-06	-6,24E-05
POCP	[kg NMVOC eq.]	3,17E-04	0,00E+00	0,00E+00	0,00E+00	6,18E-06	6,87E-06	5,49E-06	2,54E-06	-1,63E-05
ADPm ¹	[kg Sb eq.]	1,30E-08	0,00E+00	0,00E+00	0,00E+00	3,87E-10	6,04E-10	2,76E-10	4,28E-11	-3,61E-10
ADPf ¹	[MJ]	1,46E+00	0,00E+00	0,00E+00	0,00E+00	5,81E-02	9,07E-02	4,15E-02	6,02E-03	-3,07E-02
WDP ¹	[m ³ world eq. deprived]	3,34E-02	0,00E+00	0,00E+00	0,00E+00	4,05E-05	6,32E-05	2,89E-05	4,87E-05	-1,88E-04
Caption	GWP-total = Global Warming Potential - total; 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 = Ozone Depletion; AP = Acidification; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water use									
Disclaimer	¹ The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.									

ADDITIONAL ENVIRONMENTAL IMPACTS PER KG										
Parameter	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
PM	[Disease incidence]	4,54E-09	0,00E+00	0,00E+00	0,00E+00	5,70E-11	5,13E-11	4,98E-11	4,01E-11	-6,90E-10
IRP ²	[kBq U235 eq.]	6,42E-03	0,00E+00	0,00E+00	0,00E+00	1,55E-05	2,42E-05	1,10E-05	6,65E-06	-3,25E-04
ETP-fw ¹	[CTUe]	4,99E-01	0,00E+00	0,00E+00	0,00E+00	4,31E-02	6,73E-02	3,08E-02	3,43E-03	-1,72E-02
HTP-c ¹	[CTUh]	2,61E-11	0,00E+00	0,00E+00	0,00E+00	8,71E-13	1,36E-12	6,22E-13	5,06E-13	-1,27E-12
HTP-nc ¹	[CTUh]	2,13E-09	0,00E+00	0,00E+00	0,00E+00	4,57E-11	7,07E-11	3,29E-11	5,58E-11	-1,29E-10
SQP ¹	-	2,75E-01	0,00E+00	0,00E+00	0,00E+00	2,00E-02	3,12E-02	1,43E-02	1,22E-03	-8,25E-03
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless)									
Disclaimers	¹ The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.									
	² 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.									

RESOURCE USE PER KG										
Parameter	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
PERE	[MJ]	3,20E-01	0,00E+00	0,00E+00	0,00E+00	3,34E-03	5,22E-03	2,39E-03	8,11E-04	-7,92E-03
PERM	[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
PERT	[MJ]	3,20E-01	0,00E+00	0,00E+00	0,00E+00	3,34E-03	5,22E-03	2,39E-03	8,11E-04	-7,92E-03
PENRE	[MJ]	1,46E+00	0,00E+00	0,00E+00	0,00E+00	5,83E-02	9,11E-02	4,17E-02	6,02E-03	-3,08E-02
PENRM	[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
PENRT	[MJ]	1,46E+00	0,00E+00	0,00E+00	0,00E+00	5,83E-02	9,11E-02	4,17E-02	6,02E-03	-3,08E-02
SM	[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
RSF	[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
NRSF	[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
FW	[m ³]	9,22E-04	0,00E+00	0,00E+00	0,00E+00	3,83E-06	5,98E-06	2,74E-06	1,49E-06	-8,57E-06
Caption	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 resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non renewable secondary fuels; FW = Net use of fresh water									

WASTE CATEGORIES AND OUTPUT FLOWS PER KG										
Parameter	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
HWD	[kg]	4,15E-10	0,00E+00	0,00E+00	0,00E+00	3,07E-12	4,80E-12	2,19E-12	6,39E-13	-4,76E-12
NHWD	[kg]	1,10E-03	0,00E+00	0,00E+00	0,00E+00	9,15E-06	1,43E-05	6,53E-06	3,00E-02	-4,04E-02
RWD	[kg]	4,39E-05	0,00E+00	0,00E+00	0,00E+00	1,06E-07	1,65E-07	7,56E-08	6,32E-08	-2,01E-06

CRU	[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
MFR	[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
MER	[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
EEE	[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
EET	[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
Caption	HWD = Hazardous waste disposed; NHWD = Non hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EE = Exported energy									

BIOGENIC CARBON CONTENT PER KG		
Parameter	Unit	At the factory gate
Biogenic carbon content in product	[kg C]	0,00E+00
Biogenic carbon content in accompanying packaging	[kg C]	0,00E+00
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO ₂	

Additional information

Technical information on scenarios

Reference service life

RSL information	Unit
Reference service Life	50 Years
Declared product properties	Masonry and plastering mortar
Design application parameters	As appropriate
Assumed quality of work	As appropriate
Outdoor environment	As appropriate
Indoor environment	As appropriate
Usage conditions	As appropriate
Maintenance	As appropriate

End of life (C1-C4)

Scenario information	Value	Unit
Collected separately	1.00E00	kg
Collected with mixed waste	-	kg
For reuse	-	kg
For recycling (97% for road filling)	9.7E-01	kg
For energy recovery	-	kg
For final disposal (3% for road filling)	0.3E-01	kg
Assumptions for scenario development	-	-

Re-use, recovery and recycling potential (D)

Scenario information/Materiel	Value	Unit
Crushed concrete for road filling	9.7E-01	kg


Indoor air

The EPD does not give information on release of dangerous substances to indoor air because the horizontal standards on measurement of release of regulated dangerous substances from construction products using harmonised test methods according to the provisions of the respective technical committees for European product standards are not available.

Soil and water

The EPD does not give information on release of dangerous substances to soil and water because the horizontal standards on measurement of release of regulated dangerous substances from construction products using harmonised test methods according to the provisions of the respective technical committees for European product standards are not available.

References

Publisher	 www.epddanmark.dk
Programme operator	Danish Technological Institute Buildings & Environment Gregersensvej 1 DK-2630 Taastrup www.teknologisk.dk
LCA-practitioner	Mie Ostenfeldt FORCE Technology Park Allé 345 2605 Brøndby www.forcetechnology.com
LCA software / background data	GaBi, version 10.6.0.110 incl. databases www.gabi-software.com ecoinvent database version 3.7 https://ecoinvent.org/
3rd party verifier	Guangli Du Aalborg University A.C. Meyers Vænge 15 2450 København SV www.aau.dk

General programme instructions

Version 2.0

www.epddanmark.dk

EN 15804

DS/EN 15804 + A2:2019 - "Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products"

EN 16757

EN 16757:2022 "Sustainability of construction works – Environmental product declarations – Product Category Rules for concrete and concrete elements"

EN 15942

DS/EN 15942:2021 – " Sustainability of construction works – Environmental product declarations – Communication format business-to-business"

ISO 14025

DS/EN ISO 14025:2010 – " Environmental labels and declarations – Type III environmental declarations – Principles and procedures"

ISO 14040

DS/EN ISO 14040:2008 – “ Environmental management – Life cycle assessment – Principles and framework”

ISO 14044

DS/EN ISO 14044:2008 – “ Environmental management – Life cycle assessment – Requirements and guidelines”