

ENVIRONMENTAL PRODUCT DECLARATION TILBURY CEMENT PLANT CEM I 52,5 N

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THE INTERNATIONAL EPD® SYSTEM

ECO PLATFORM
EPD
VERIFIED

In accordance with ISO 14025:2006 and
EN 15804:2012+A2:2019/AC:2021 for:
Tilbury Cement Plant CEM I 52,5 N

from
Cemex UK Ltd

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CEMEX

GENERAL INFORMATION

ACCOUNTABILITIES FOR PCR, LCA AND INDEPENDENT, THIRD-PARTY VERIFICATION

Product Category Rules (PCR)

CEN standard EN 15804 serves as the Core Product Category Rules (PCR)

Product Category Rules (PCR):

- PCR 2019:14 Construction products; Version 1.3.4
- c-PCR-001 Cement and Building Lime (EN 16908:2017+A1:2022) 2022-05-18
- UN CPC: 3744

PCR review was conducted by: The Technical Committee of the International EPD System

Life Cycle Assessment (LCA)

LCA Accountability

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Third-party verification

- Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:
EPD verification by individual verifier
- Third-party verifier: Angela Schindler, Umweltberatung
- Approved by: The International EPD® System

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, or not compliant with EN 15804, 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.



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CONTENTS

COMPANY INFORMATION

4

Owner of the EPD	4
Description of the organisation	4
Product-related or management system-related certifications	4
Name and location of production site(s)	4

PRODUCT INFORMATION

5

Product name	5
Product identification	5
Product description	5
Materials composition	5
Technical specifications and physical properties of the product	5
Geographical scope	5

LCA INFORMATION

6

Functional unit/declared unit	6
Reference service life	6
Time representativeness	6
Database(s) and LCA software used	6
Description of system boundaries	6
Data collection	7
Power mix	7
CO ₂ -Certificates	8
Cut-off rules	8
Allocations	8

RESULTS OF THE ENVIRONMENTAL PERFORMANCE INDICATORS

DIFFERENCES VERSUS PREVIOUS VERSIONS

REFERENCES

CONTACT INFORMATION

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DESCRIPTION OF THE ORGANISATION

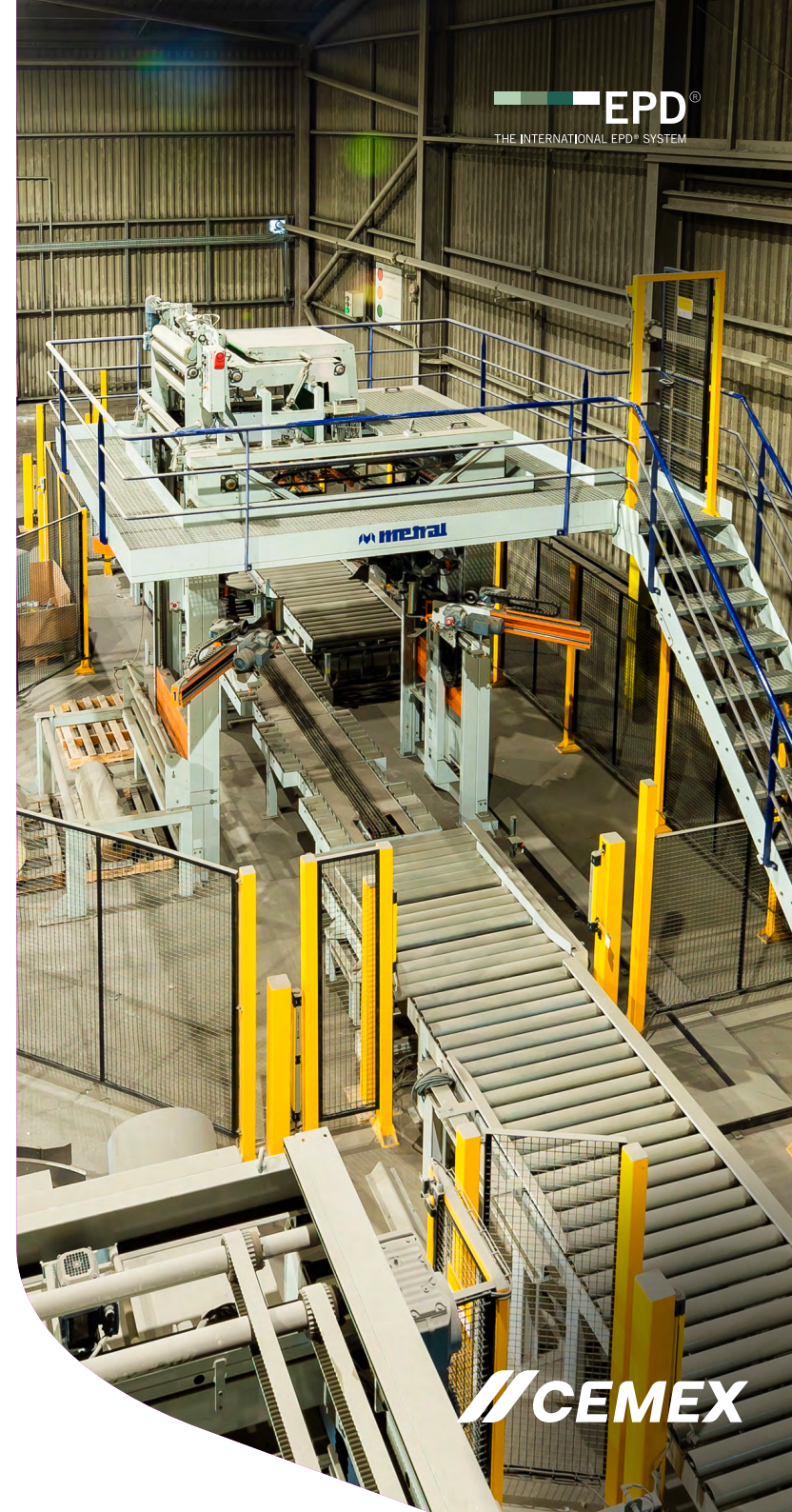
Cemex UK is a leading supplier of cement, ready mix concrete, mortars, screeds, aggregates, asphalts, concrete block paving and concrete blocks.

PRODUCT-RELATED OR MANAGEMENT SYSTEM-RELATED CERTIFICATIONS

Cemex UK cement plants have management systems certified according to ISO 9001:2015 "Quality Management", ISO 14001:2015 "Environmental Management" standards and ISO50001:2018 "Energy Management". The calculation of the Product Footprint for all Cements is carried out in compliance with EN 15804:2022.

NAME AND LOCATION OF PRODUCTION SITE(S)

Tilbury Cement Plant, Port of Tilbury.



PRODUCT INFORMATION

PRODUCT NAME

CEM I 52,5N

PRODUCT IDENTIFICATION

Certificate of Conformity no: 1333-CPR-0176

PRODUCT DESCRIPTION

The original “general purpose” product, Portland cement is used in various applications, from concrete, mortar and render to the manufacture of pre-cast units such as blocks, bricks, pipes and tiles.

Cemex Portland is produced by burning a precisely specified mixture of raw materials containing lime, silica, alumina and small quantities of other materials to form a clinker. The clinker, together with calcium sulfate to control setting, is then ground to produce cement of the required fineness. Up to 5% of minor additional constituents (typically, limestone, fly ash or granulated blastfurnace slag) may be incorporated at the grinding stage.

It is produced in accordance with the EN 197-1 standard. It is characterized by rapid strength gain and high final strength. It has reduced water demand and significant heat of hydration.

It is recommended to produce concrete with requirements for high initial and final mechanical resistance, shotcrete, and injection concrete. It is suitable to produce precast and prefabricated elements, as well as prestressed constructions for the construction of public and commercial buildings.

It is particularly recommended for use in concrete work at low temperatures, for the construction of structures where quick formwork removal, handling of elements, or early structural loading is required. Additionally, it is suitable to produce waterproof concrete and frost resistant concrete.

MATERIALS COMPOSITION

Product raw material

Product components	Weight-%	Post-consumer material, weight-%	Biogenic material, weight-% and kg C/kg
Clinker	95 - 100	0	0
Limestone	0 - 5	0	0
Other constituents	0	0	0
TOTAL	100	0	0

*Gypsum is not included in the aforementioned composition

Packaging material

This cement is being shipped in bulk.

Dangerous substances from the candidate list of SVHC for Authorisation

Declared products contain less than 0,1% or no hazardous substance, from the “Candidate list of Substances of Very High Concern”, updated 14/06/2023.

Cement is a preparation and is therefore not subject to REACH registration, although it must also be classified and labelled. Under the European Union (Withdrawal) Act 2018, the EU REACH Regulation was brought into UK law on 1 January 2021 and is known as UK REACH.

REACH, and related legislation, were replicated in the UK with the changes needed to make it operable in a domestic context. The key principles of the EU REACH Regulation were retained in UK REACH.

TECHNICAL SPECIFICATIONS AND PHYSICAL PROPERTIES OF THE PRODUCT



Product sheet for the cement can be retrieved [here](#).



Further information can be found at www.cemex.co.uk

GEOGRAPHICAL SCOPE

Geographical scope of the product is Europe. The product is produced in United Kingdom, but some raw materials originate from other European countries.



LCA INFORMATION

FUNCTIONAL UNIT / DECLARED UNIT

A declared unit is 1 tonne of cement.

REFERENCE SERVICE LIFE

Not relevant due to the “cradle to gate” boundary conditions.

TIME REPRESENTATIVENESS

The foreground production data correspond to the period from January 1, 2022 to December 31, 2022.

DATABASE(S) AND LCA SOFTWARE USED

GCCA Industry EPD Tool for Cement and Concrete (v.4.2), International version and Ecoinvent database (v.3.5).





DESCRIPTION OF SYSTEM BOUNDARIES

The scope of the study is “Cradle to Gate”, covering the product stage - modules A1-A3:

A1 - Raw Materials Supply

This module takes into account raw material extraction, processing and energy used in the production process.

A2 - Transport

This module includes transportation of the raw materials and fuels from supplier to plant gate. Transportation types are considered as sea, road and conveyor belts.

A3 - Manufacturing

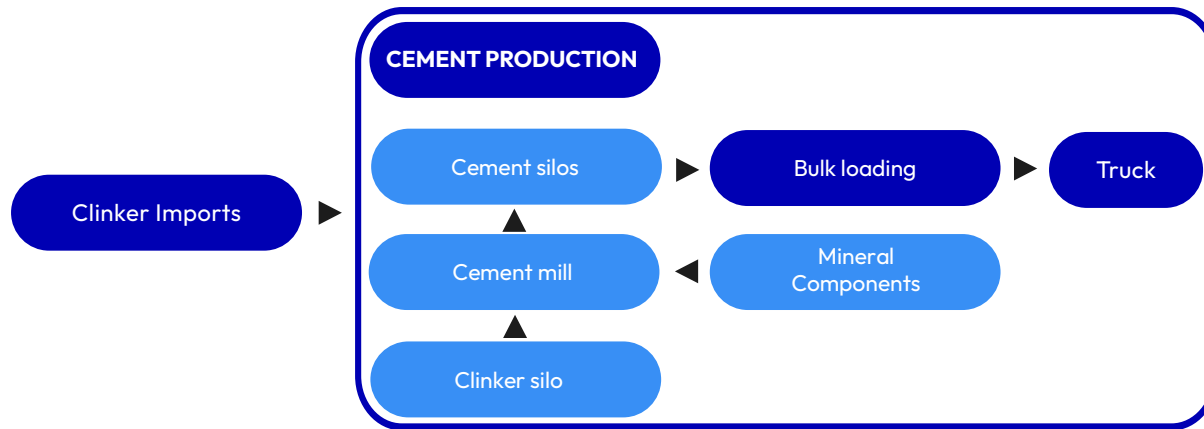
This stage includes energy and water consumption during the manufacturing process, as well as the processing of any waste arising from this stage. Followed production processes are:

- Quarry Operations
- Crusher
- Raw Mill & Coal Mill
- Rotary Kiln
- Cement Mill
- Bulk loading

System diagram

	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	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Geography	EUR	EUR	UK	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Specific data used	>99%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation - products	Not relevant			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation - sites	Not relevant			-	-	-	-	-	-	-	-	-	-	-	-	-	-

X= included, ND = module not declared; EUR = Europe, UK = United Kingdom



DATA COLLECTION

All material flows of the processes are based on company and site-specific data gathered for one year of operation, for the period from January 1 2022 to December 31 2022.

Calculations for the evaluation are based on a Cemex institutional tool known as Grafoper. Data is based on the production of clinker and cement. They are based on actual metered consumption, actual receipt of materials, shipment of products from SAP and final physical stocks.

When production is split between different lines such as two cement mills, the process is considered as a single product.

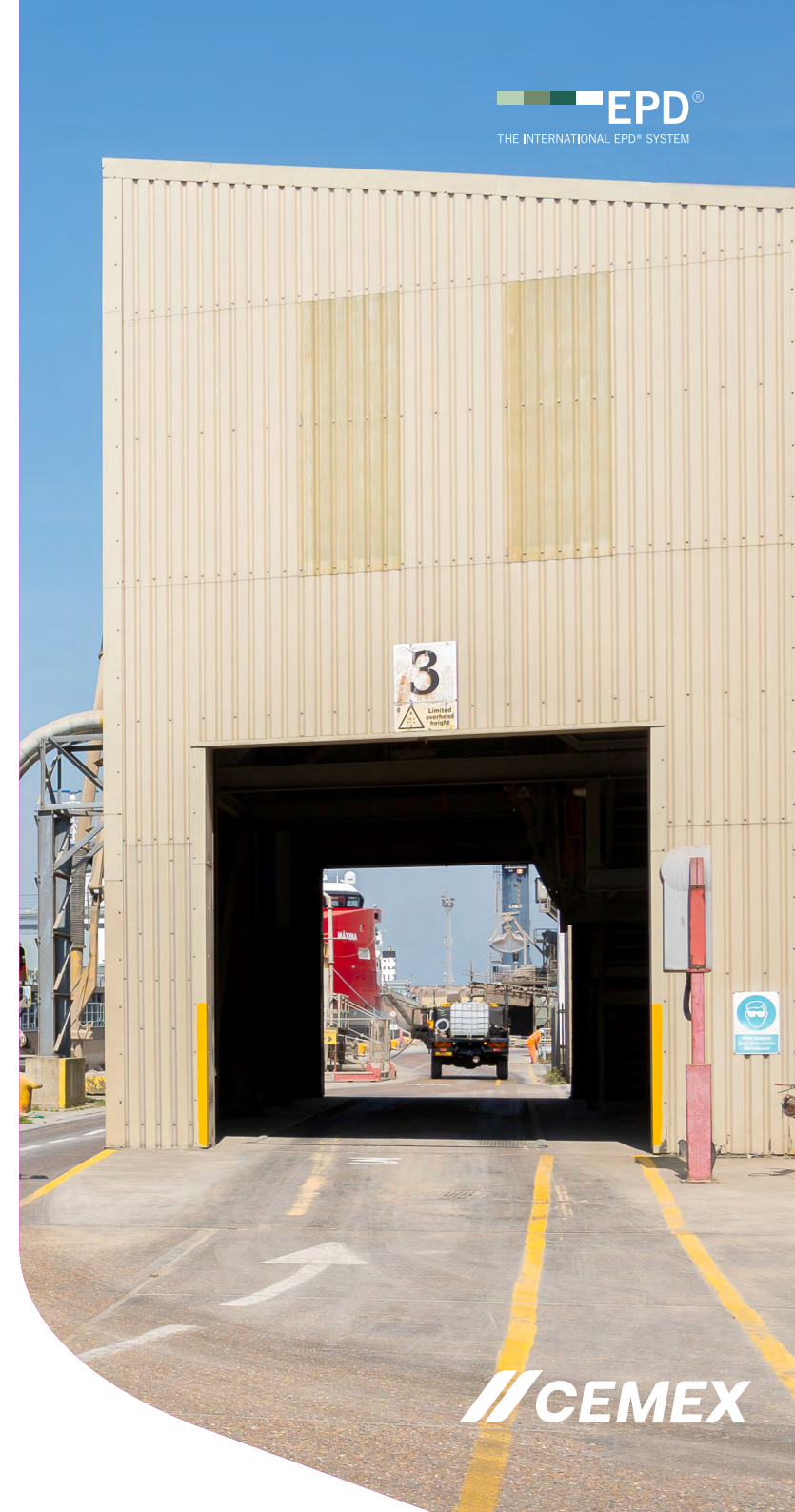
In the case of other data such as waste, water, stack emissions, regulatory and sustainability reports are used.

POWER MIX

Cemex UK procures electrical energy for the cement production processes at Rugby and Tilbury from the market. The contracted supplier of electrical energy is Engie, based on an electricity supply agreement. The cement mills and other electrically powered equipment are operated on externally purchased electricity which is 100% renewable backed by Renewable Energy Guarantees of Origin (REGOs) and/or Guarantees of Origin (GoOs) as below:

Coal and peat	%	0	Nuclear	%	0
Oil	%	0	Hydro	%	0
Gas	%	0	Geothermal	%	0
Biomass	%	23.4	Solar	%	2.1
Waste	%	64.8	Wind	%	9.7

The calculated climate impact is 0.0281 kgCO2/kWh.



CO₂-CERTIFICATES

No compensation offsets have been used in the LCA calculation.

CUT-OFF RULES

All raw materials and energy input to the manufacturing process have been included.

Process energy, water use and discharge and process and general waste are included.

In accordance with EN 15804, emissions from capital goods (production and transportation of machinery, equipment, and buildings), employee transportation, and maintenance materials are not included.

ALLOCATIONS

The total values for fuel consumed by the operation of vehicles for transportation within the plant, quantities of water withdrawn and discharged, and the amounts of waste generated, over a one-year period, are allocated to clinker.

Secondary materials, co-product allocations

Tilbury uses three sources of clinker. Cemex Rugby clinker uses small quantities of paper ash and slag. In accordance with the GCCA Manual zero allocation has been applied as we receive a payment for the materials. Cemex Alcanar clinker uses slag. In accordance with the GCCA Manual, economic allocation has been applied. For other non-Cemex clinkers, the GCCA default clinker is used which includes coproducts of aluminium oxide and ash for which economic allocation is applied as detailed in the GCCA manual.



RESULTS OF THE ENVIRONMENTAL PERFORMANCE INDICATORS

The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

MANDATORY IMPACT CATEGORY INDICATORS ACCORDING TO EN 15804

Results per declared unit of 1000 kg of CEM I 52.5 N cement		
Indicator	Unit	A1-A3
GWP- fossil¹	kg CO ₂ eq.	769
GWP- biogenic¹	kg CO ₂ eq.	0.296
GWP-luluc	kg CO ₂ eq.	0.0598
GWP-total¹	kg CO ₂ eq.	770
ODP	kg CFC 11 eq.	1.69E-5
AP	mol H+ eq.	1.97
EP-freshwater	kg P eq.	4.03E-2
EP-marine	kg N eq.	2.95E-3
EP-terrestrial	mol N eq.	6.20
POCP	kg NMVOC eq.	1.55
ADP-minerals&metals*	kg Sb eq.	1.71E-4
ADP-fossil*	MJ	3150
WDP*	m ³	39.66

¹The indicated values (gross values) include the greenhouse gas emissions from the incineration of secondary fuels at clinker production. The net GWP-tot (excluding the emissions from the incineration of secondary fuels at clinker production) is 7.16E2 kg CO₂-eq. The net GWP-fos is 7.16E2 kg CO₂-eq. The net GWP-bio is 1.32E-1 kg CO₂-eq. The indicated values (gross values) include the greenhouse gas emissions from the incineration of secondary fuels at clinker production. The net GWP-GHG (excluding the emissions from the incineration of secondary fuels at clinker production) is 7.16E2 kg CO₂-eq

*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.



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



ADDITIONAL MANDATORY AND VOLUNTARY IMPACT CATEGORY INDICATORS

Results per declared unit of 1000 kg of CEM I 52.5 N cement

Indicator	Unit	A1	A2	A3	A1-A3 (Total)
GWP-GHG²	kg CO ₂ eq.	747	20.8	2.36	770

²The indicated values (gross values) include the greenhouse gas emissions from the incineration of secondary fuels at clinker production. The net GWP-tot (excluding the emissions from the incineration of secondary fuels at clinker production) is 7.16E2 kg CO₂-eq. The net GWP-fos is 7.16E2 kg CO₂-eq

RESOURCE USE INDICATORS

Results per declared unit of 1000 kg of CEM I 52.5 N cement

Indicator	Unit	A1-A3
PERE	MJ	324
PERM	MJ	0
PERT	MJ	324
PENRE	MJ	3150
PENRM	MJ	0
PENRT	MJ	3150
SM	kg	117
RSF	MJ	675
NRSF	MJ	519
NFW	m ³	0.98

WASTE INDICATORS³

Results per declared unit of 1000 kg of CEM I 52.5 N cement

Indicator	Unit	A1-A3
Hazardous waste disposed	kg	0.06
Non-hazardous waste disposed	kg	1.74
Radioactive waste disposed	kg	0

³The waste indicators in the Global Cement and Concrete Association (GCCA) tool exclusively pertain to the foreground system, diverging from the requirements outlined in EN 15804+A2, which mandates consideration of the entire life cycle. Consequently, this deviation from the standard results in an inherent incomparability with other Environmental Product Declarations (EPDs) with regards to waste indicators.

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
NFW	Use of net fresh water



OUTPUT FLOW INDICATORS

Results per declared unit of 1000 kg of CEM I 52.5 N cement		
Indicator	Unit	A1-A3
Components for re-use	kg	0
Material for recycling	kg	1.2
Materials for energy recovery	kg	0
Exported energy, electricity	MJ	0
Exported energy, thermal	MJ	0

OTHER ENVIRONMENTAL PERFORMANCE INDICATORS

Results per declared unit of 1000 kg of CEM I 52.5 N cement		
Indicator	Unit	A1-A3
Potential incidence of disease due to PM emissions	Disease incidence	1.58E-5
Potential human exposure efficiency relative to U235	kBq U235 eq.	23.52
Potential Comparative Toxic Unit for ecosystems	CTUe	90.2
Potential Comparative Toxic Unit for humans - cancer	CTUh	1.49E-6
Potential Comparative Toxic Unit for humans - non-cancer	CTUh	4.46E-5
Potential soil quality index	Dimensionless	3112

DIFFERENCES VERSUS PREVIOUS VERSIONS

First EPD version - no previous versions



REFERENCES

The following reference documents have been used as the basis for this methodology, For dated references, only the edition cited applies, For undated references, the latest edition of the referenced document (including any amendments) applies:

- Cement Standards: EN 197-1
- EN 15804:2012+A2:2019, Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products
- EPD General Programme Instructions for the International EPD System, Version 4,0, Date 2021-03-29
- EPD Product Category Rules (PCR), Data 2022-11-01, Construction products, PCR 2019:14, Version 1.3.4
- EPD Cement and Building Lime (EN16908:2017+A1:2022), Product group classification: UN CPC 374, C-PCR-001 (PCR 2019:14), Version: 2022-05-18
- EPD PCR 2019:14 Construction products, version 1,0 (EN 15804+A2)
- EN ISO 14025:2010, Environmental labels and declarations - Type III environmental declarations - Principles and procedures (ISO 14025:2006)
- EN ISO 14040:2008/A1, Environmental management - Life cycle assessment - Principles and framework (ISO 14040:2006/ Amd 1:2020; EN ISO 14040:2006/A1:2020)
- EN ISO 14044:2006, Environmental management - Life cycle assessment - Requirements and guidelines (ISO 14044:2006)
- EN ISO 14067:2018, Greenhouse gases - Carbon footprint of products - Requirements and guidelines for quantification (ISO 14067:2018)
- ISO 15686-1, Buildings and constructed assets - Service life planning - Part 1: General principles and framework
- ISO 15686-2, Buildings and constructed assets - Service life planning - Part 2: Service life prediction procedures
- ISO 15686-7, Buildings and constructed assets - Service life planning - Part 7: Performance evaluation for feedback of service life data from practice
- ISO 15686-8:2008, Buildings and constructed assets - Service life planning - Part 8: Reference service life and service life estimation
- ISO 21930:2017, Sustainability in building construction and civil engineering - Core rules for environmental product declarations of construction products and services
- European Commission - Joint Research Centre - Institute for Environment and Sustainability: International Reference Life Cycle Data System (ILCD) Handbook - Nomenclature and Conventions, 2010, EUR 24384 EN, Luxembourg, Publications Office of the European Union; 2010, ISBN 978-92-79-15861-2
- Industry EPD Tool for Cement and Concrete (<https://concrete-epd-tool.org/>)
 - User Guide (v4.2, International version, 18 December 2023)
 - LCA Model (v4.2, International version, 18 December 2023)
 - LCA Database (v4.2, 18 December 2023)



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