

ITALCEMENTI

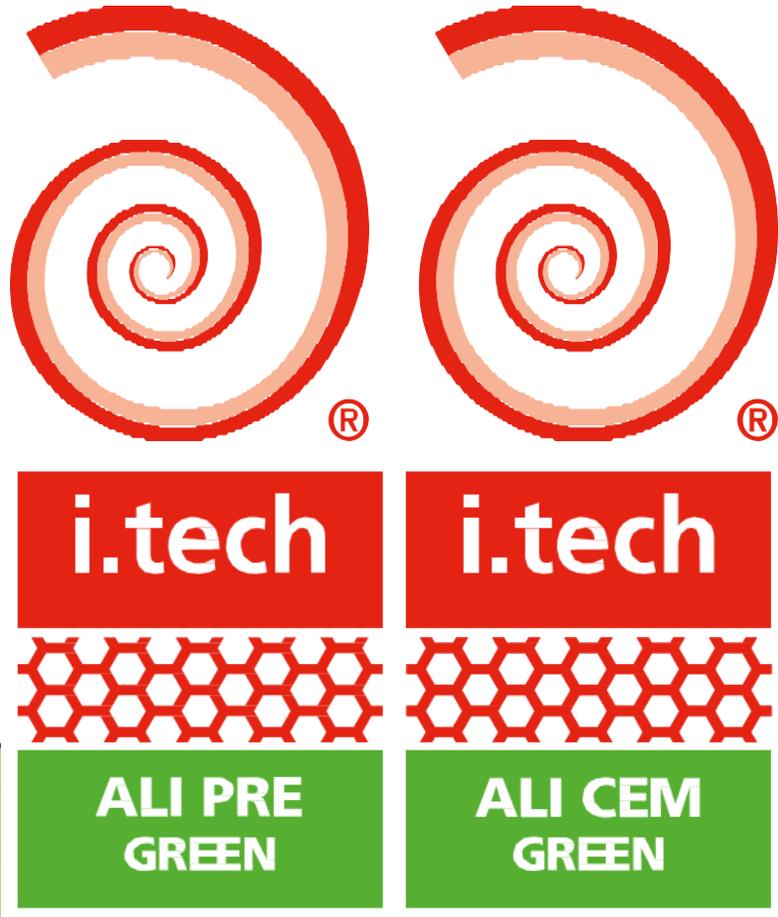


Environmental Product Declaration

Publication date: 2013/02/22

Revision date: 2021/02/24

Valid until: 2022/12/20



i.tech ALI PRE GREEN

Global warming potential	740 kg CO ₂ eq/ton
Use of recycled materials	605 kg/ton
Recycled materials content (ISO 14021 compliant)	56%
Recycled pre-consumer materials (ISO 14021 compliant)	56%
Recycled post-consumer materials (ISO 14021 compliant)	0%

i.tech ALI CEM GREEN

Global warming potential	640 kg CO ₂ eq/ton
Use of recycled materials	488 kg/ton
Recycled materials content (ISO 14021 compliant)	45%
Recycled pre-consumer materials (ISO 14021 compliant)	45%
Recycled post-consumer materials (ISO 14021 compliant)	0%

Company: Italcementi S.p.A.

Website: www.italcementi.it

Registration No: S-P-00404

Validity: 20/12/2022

LCA coverage: Cradle-to-gate



Declaration of general information

This Environmental Product Declaration (EPD) covers the **i.tech ALI PRE GREEN** and **i.tech ALI CEM GREEN**, two products with low CO₂ emissions (<477 kgCO₂ for A3 stage) and high recycled material content (>30%). The recycled material content is determined following guidelines in ISO 14021 whereas the CO₂ emissions threshold is derived from the third party verified country or regional specific database of the Global Cement and Concrete Association (GCCA), former Cement Sustainability Initiative (CSI).

Manufacturer information

Italcementi has been the leading company in Italy in the production of cement since 1864. Over one hundred years of history built on people, knowledge and innovation that have enabled the company to become a leading player in the construction material industry from the very beginning. Italcementi's widespread presence, rooted in the territory, and the ability of offering innovative, quality products, are at the base of integrated solutions and applications that meet the needs of the cement and concrete market. The industrial structure consists of eight plants for cement production, a plant for special products with a reduced environmental footprint compared to traditional cement and several grinding centres. The production sites have obtained the ISO 14001 environmental certificate and, in some geographical areas, also the CSC Certificate, which certifies the sustainable procurement process along the entire production chain according to the basic principles of Sustainability. The industrial network is complete and integrated, thanks to the remarkable presence in the concrete and aggregates industry with the company Calcestruzzi.

Italcementi, alongside Calcestruzzi, offers a wide range of products, applications, and solutions, from cement to ready-mixed concrete. The category of traditional cements consists of products suitable for specific construction types: road and marine infrastructures, civil and industrial floorings, dams, extraction wells and the most common applications for the construction sectors. Alongside traditional cement, Italcementi also offers a range of solutions for the renovation of buildings, with binders, natural lime, mortar and leveling compounds, products that stand out for their quality, durability, and ease of application. Additionally, there is a range of eco.build products on offer meeting the growing market demand for solutions oriented to environmental sustainability and promoting the circular economy.

Italcementi is a founding member of the Italian Green Building Council, the association that promotes the dissemination of the principles of the circular economy in the building industry, and is also a partner of the Global Compact, the international organisation that promotes the principles of sustainable development. Now Italcementi is part of the HeidelbergCement Group, worldwide leader in the industry, with 53,000 employees in over 3,000 production plants in 50 countries in 5 continents. Among the sustainability goals of the Group there is the reduction by 30% of the CO₂ emissions per cement ton within 2025.

Further information on HeidelbergCement and Italcementi can be accessed at the official websites

<http://www.heidelbergcement.com/en> and <http://www.italcementi.it> .



Product description

i.tech ALI CEM GREEN is manufactured by Italcementi in its cement plant situated at Guardiaregia in the South of Italy. The main component of **i.tech ALI CEM GREEN** is **i.tech ALI PRE GREEN**, a Calcium Sulfoaluminate clinker (CSA). **i.tech ALI CEM GREEN** and **i.tech ALI PRE GREEN** are part of the Italcementi i.tech Family, highly technological products able to guarantee ultra-high performance in terms of strength and safe-ty. This EPD refers to both **i.tech ALI PRE GREEN** and **i.tech ALI CEM GREEN** used for rapid setting, high early strength development and shrinkage compensation.



i.tech ALI CEM GREEN in an effective solution for a wide variety of applications:

- ✓ Adhesives
- ✓ Rapid sealants and mortars
- ✓ Precasts
- ✓ Floor screeds
- ✓ Shotcrete
- ✓ Waste inertization.

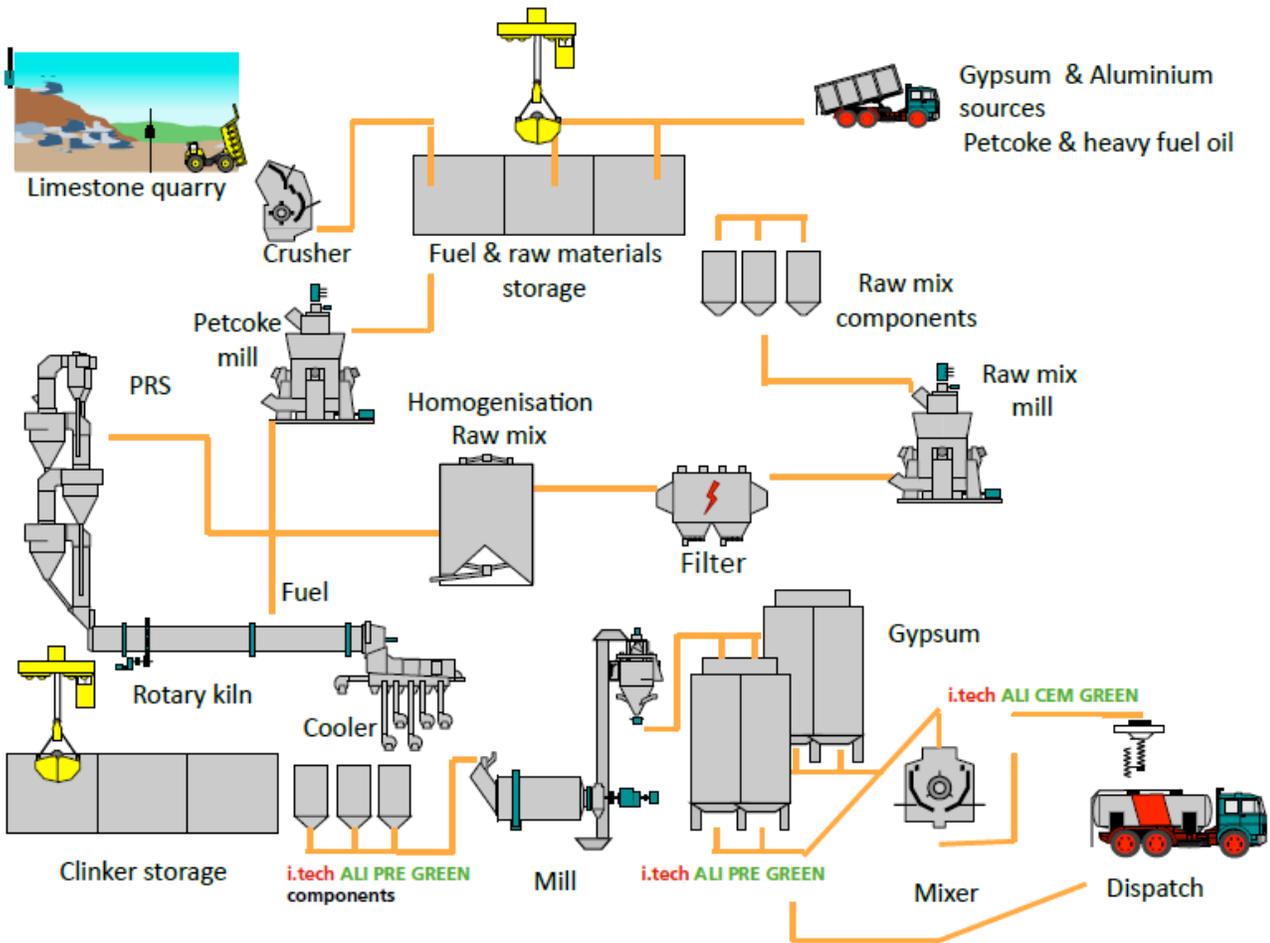
In addition **i.tech ALI CEM GREEN** is appropriate for products that are exposed to aggressive environments such as acid-resistant coatings.

Chemically, **i.tech ALI CEM GREEN** is mainly composed of tetracalcium aluminate sulphate and its composition is optimized to confer it the ability to achieve not only high early strength, but also a progressive strength development up to very high values (i.e 60 MPa at 28 days).

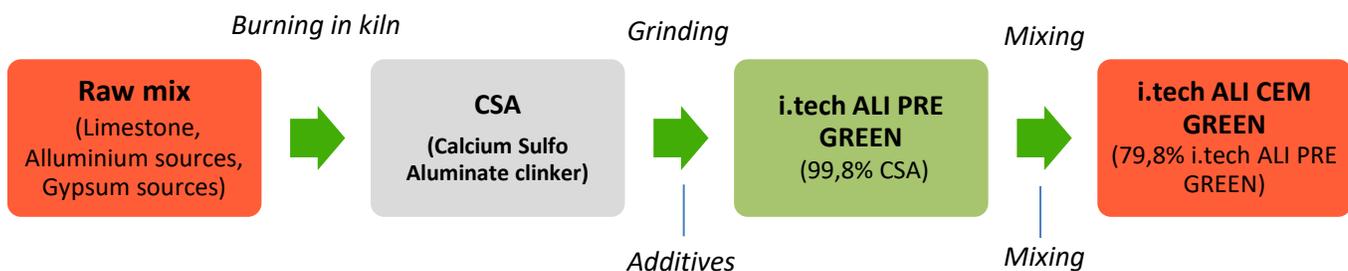
The production process of **i.tech ALI CEM GREEN** is similar to the general cement production process. Raw materials are combusted in a kiln producing clinker. In the case of **i.tech ALI CEM GREEN**, CSA is produced at reduced kiln temperatures (<1300°C vs 1450°C of portland clinker) due to lower required temperatures for the clinkerization reaction. CSA is ground together with selected additives to produce **i.tech ALI PRE GREEN**. The final production step involves the mixing of **i.tech ALI PRE GREEN** with gypsum to produce **i.tech ALI CEM GREEN**.



Production process



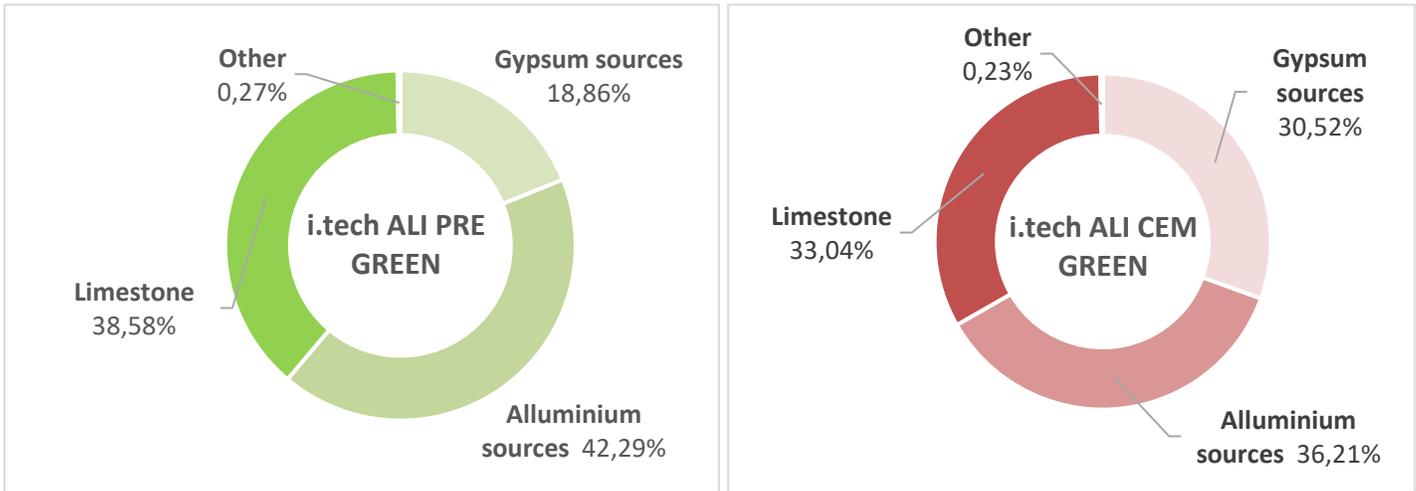
Main pre-products



The overall composition of the products under study and the energy input involved are provided below. This shows relative percentages of materials and energy sources used in producing i.tech ALI PRE GREEN and i.tech ALI CEM GREEN, without considering loss in mass during combustion.



Product composition: i.tech ALI PRE and i.tech ALI CEM



Energy input (process)

	Thermal Energy (MJ)	Electrical Energy (kWh)
i.tech ALI PRE GREEN	2.576	235
i.tech ALI CEM GREEN	1.999	201

i.tech ALI PRE GREEN and i.tech ALI CEM GREEN contain a high percentage of recycled materials used as aluminum sources. This particularity implies savings in natural resources and energy which would otherwise have been consumed. The aluminum based recycled materials result from the production of secondary aluminum and as such are classified as pre-consumer recycled materials according to the standard ISO 14021. Following rules set in this standard, the recycled material content of i.tech ALI PRE GREEN and i.tech ALI CEM GREEN is at 56% and 45% respectively.

EPD type and programme operator

This is an Environmental Product Declaration (EPD) compliant to a Type III environmental declaration as defined by ISO 14025:2006. i.tech ALI CEM GREEN and i.tech ALI PRE GREEN are construction products therefore this EPD is compliant to EN 15804:2012+A1:2013. The EPD is subject to the International EPD System (IES) which acts as the Programme Operator and is aligned to the Product Category Rules (PCR) for the assessment of the environmental performance of UN CPC 374 relative to cement (C-PCR-001 “Cement and building lime” (EN 16908) to PCR 2019:14 Construction products, version 1.0). The General Programme Instructions (version 3.1 dated 2019-09-18) of the IES have been implemented. Further information on IES is available on the official website www.environdec.com.



The EPD refers to a cradle-to-gate boundary so as to meet the following goals:

- ✓ Establish third party verified environmental information
- ✓ Provide information and data for business-to-business communication

This EPD applies to the production of **i.tech ALI PRE GREEN** and **i.tech ALI CEM GREEN** in Italy during the year 2019. It results from the life cycle assessment study carried out following the principles contained in the ISO 14040 series of standards.

EPDs within the same product category but from different EPD Programmes shall not be comparable. Moreover as stated in EN 15804:2012+A1:2013, the comparison of products on the basis of their EPD is defined by the contribution they make to the environmental performance of the building. Consequently, comparison of the environmental performance of construction products using this EPD information shall be based on the product's use in and its impacts on the building and shall consider the complete life cycle of the product within the building or construction works.

Declaration of environmental parameters derived from LCA

Scope

Declared unit	1000 kg (1 tonne) i.tech ALI PRE GREEN
Declared unit	1000 kg (1 tonne) i.tech ALI CEM GREEN
Temporary boundary	Year 2019 production
System boundary	From cradle to gate A1-3 A1 (Upstream processes) - Raw material and fuel acquisition, Electricity generation & distribution A2 (Upstream processes) - Transportation to plant. A3 (Core processes) - Manufacturing processes in plant, treatment waste from manufacturing processes.

The results in terms of environmental impacts, resource use and other environmental information are based on the declared unit.

The LCA model includes a representative inventory of the product system in line with cut-off requirements of the reference PCR. Input materials and energy input to the product system do not contain biogenic carbon, consequently there is no Greenhouse Gas emission from biogenic sources.

The Global Cement and Concrete Association (GCCA) Industry EPD Tool for Cement and Concrete v3.0 (EPD Tool), pre-verified against requirements of the reference cement PCR, was used in computing Life cycle impacts of **i.tech ALI PRE GREEN** and **i.tech ALI CEM GREEN**. The Tool applies specific datasets of the cement production process together with representative datasets in Ecoinvent version 3.5 to compute environmental parameters of the product under study.



Parameters describing environmental impacts

The following information on environmental impacts are expressed in terms of impact category parameters using characterization factors.

Potential environmental impacts per ton of i.tech ALI PRE GREEN

IMPACT CATEGORY PER TON I.TECH ALI PRE GREEN		UNIT	CRADLE TO GATE A1-A3
Global warming potential, total	GWP-tot	kg CO _{2eq}	7.40+E2
Ozone depletion potential	ODP	kg CFC11 _{eq}	5.39E-05
Acidification potential	AP	mol H+ _{eq}	2.64E+00
Eutrophication potential	EP-ter	mol N _{eq}	8.16E+00
Formation potential of tropospheric ozone	POCP	kg NMVOC _{eq}	2.06E+00
Abiotic depletion potential for non-fossil resources	ADPE	kg Sb _{eq}	4.52E-04
Abiotic depletion for fossil resources potential	ADPF	MJ	4.73E+03

Potential environmental impacts per ton of i.tech ALI CEM GREEN

IMPACT CATEGORY PER TON I.TECH ALI CEM GREEN		UNIT	CRADLE TO GATE A1-A3
Global warming potential, total	GWP-tot	kg CO _{2eq}	6.40E+02
Ozone depletion potential	ODP	kg CFC11 _{eq}	4.99E-05
Acidification potential	AP	mol H+ _{eq}	2.37E+00
Eutrophication potential	EP-ter	mol N _{eq}	7.08E+00
Formation potential of tropospheric ozone	POCP	kg NMVOC _{eq}	1.81E+00
Abiotic depletion potential for non-fossil resources	ADPE	kg Sb _{eq}	4.60E-04
Abiotic depletion for fossil resources potential	ADPF	MJ	4.40E+03

Parameters describing resource use

The following environmental parameters apply data based on LCI. They describe the use of renewable and non-renewable material resources, renewable and non-renewable primary energy, water use and electricity use during manufacturing.



Resource use per ton of i.tech ALI PRE GREEN

I.TECH ALI PRE GREEN		UNIT	CRADLE TO GATE A1-A3
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	PERE	MJ	5.42E+02
Use of renewable primary energy resources used as raw materials	PERM	MJ	0.00E+00
Total use of renewable primary energy resources	PERT	MJ	5.42E+02
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	PENRE	MJ	5.94E+03
Use of non-renewable primary energy resources used as raw materials	PENRM	MJ	0.00E+00
Total use of non-renewable primary energy resources	PENRT	MJ	5.94E+03
Use of secondary material	SM	Kg	6.05E+02
Net use of fresh water	NFW	m ³	1.74E+00

Resource use per ton of i.tech ALI CEM GREEN

I.TECH ALI CEM GREEN		UNIT	CRADLE TO GATE A1-A3
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	PERE	MJ	4.94E+02
Use of renewable primary energy resources used as raw materials	PERM	MJ	0.00E+00
Total use of renewable primary energy resources	PERT	MJ	3.74E+02
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	PENRE	MJ	5.50E+03
Use of non-renewable primary energy resources used as raw materials	PENRM	MJ	0.00E+00
Total use of non-renewable primary energy resources	PENRT	MJ	5.50E+03
Use of secondary material	SM	Kg	4.88E+02
Net use of fresh water	NFW	m ³	1.58E+00



Use of renewable secondary fuels and use of non-renewable secondary fuels are zero for both **i.tech ALI PRE GREEN** and **i.tech ALI CEM GREEN**.

Other environmental indicators

The following parameters describe waste categories and other flows derived from LCI.

Other indicators per ton of i.tech ALI PRE GREEN

PER TON i.tech ALI PRE GREEN	UNIT	CRADLE TO GATE A1-A3
Hazardous waste	kg	2.5E-1
Non-hazardous waste	kg	2.1E0
Dust	kg	1.00E-2

Other indicators per ton of i.tech ALI CEM GREEN

PER TON i.tech ALI CEM GREEN	UNIT	CRADLE TO GATE A1-A3
Hazardous waste	kg	2.0E-1
Non-hazardous waste	kg	1.7E0
Dust	kg	1.00E-2

Components for re-use, Materials for recycling, Materials for energy recovery, Exported energy and Radioactive waste disposed are zero for both **i.tech ALI PRE GREEN** and **i.tech ALI CEM GREEN**.

Other indicators per ton of i.tech ALI CEM GREEN

Guardiaregia plant, certified according to ISO 14001:2015 and ISO 9001:2015, covers a total surface area of 96700 m² and has been in operation for 60 years. The quarry supplying limestone for production activities is at 4 km from the plant and has a surface area of 425.730 m². Safety data sheets of i.tech ALI PRE GREEN and i.tech ALI CEM GREEN provide information on proper handling of these products. They are intended for use by professionals and enable them to take necessary measures as regards health, safety and environment at worksites.

Safety data sheets and other technical documents of i.tech ALI CEM GREEN and i.tech ALI PRE GREEN can be consulted on the Italcementi website www.italcementi.it.



Additional information

Product innovation is one of the strategic pillars of Italcementi and the parent Company, HeidelbergCement. Consequently, the production of **i.tech ALI PRE GREEN** and **i.tech ALI CEM GREEN** is in line with Group Sustainability Commitments 2030 advocating product design suitable for energy efficiency in buildings, sustainable construction and optimizing the use of recycled materials. Moreover, new clinker, cements or binders alternative to Ordinary Portland Cement are under development. In particular, research focuses on the use of renewable and reusable raw materials and the development of specialty admixtures and special additions for concrete, also through investigations and experiments based on nano and biotechnologies applied to the construction materials sector. More information on Sustainability can be accessed at the official website.

<https://www.heidelbergcement.com/en/responsibility>

Changes versus previous version

Despite there are no relevant changes in the production process and in the mix of fuels and raw materials used, some minor improvements of environmental parameters occurred between the years 2017 and 2019; this release takes onboard these variations and the updates of the reference documents which occurred in recent years.

References

ISO 14025:2006	Environmental labels and declarations - Type III environmental declarations
ISO 14040:2006	Environmental management - Life cycle assessment - Principles and Framework
ISO 14044:2006	Environmental management - Life cycle assessment - Requirements and Guidelines
ISO 14021:2012	Environmental labels and declarations – Self-declared environmental claims (Type II Environmental labelling)
GPI	General Programme Instructions of IES www.environdec.com (v 3.1)
EN 15804:2013	Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products
PCR for cement	www.environdec.com - PRODUCT CATEGORY RULES (PCR) for Product Group “Cement”, CPC 374, C-PCR-001 “Cement and building lime” (EN 16908) to PCR 2019:14 Construction products, version 1.0



Demonstration of verification

CEN standard EN 15804 serves as the Core Product Category Rules (PCR).
Programme:  EPD® The international EPD® System
PCR: UN CPC 374 - C-PCR-001 "Cement and building lime" (EN 16908) v. 2019-12-20 to PCR 2019:14 "Construction Products" v.1.0
PCR Moderator: Martin Erlandson, IVL Swedish Environmental Research Institute, martin.erlandson@ivl.se.
PCR Comitee: IVL Swedish Environmental Research Institute Secretariat of the International EPD® System
Independent verification of the declaration and data, according to ISO 14025:2010 <input checked="" type="checkbox"/> EPD Process Certification (Internal) <input type="checkbox"/> EPD Verification (External)
EPD Registration No.: S-P-00404
Date of Certification: 2013/02/22
Version date: 2021/02/24
Validity: 2022/12/20
Third part Independent Verifier: Certiquality Srl (Number of accreditation: 003H rev.15)
Accredited by: Accredia



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Glossary

Ozone layer depletion 20a	Destructive effects on the stratospheric ozone layer over a time horizon of 20 years.
Acidification	Increase of soil and water acidity.
Eutrophication	Excessive levels of macronutrients in the environment caused by emissions of nutrients to air, water and soil.
Photochemical oxidation	Oxidizing of volatile compounds in the presence of nitrogen oxides (NOx) which frees ozone in the low atmosphere.
Abiotic depletion	Extraction of minerals and fossil fuels due to inputs in the system.





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