

Environmental Product Declaration

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for GP Cement from Southern Cross Cement Pty Ltd

Programme:	EPD Australasia, https://epd-australasia.com/ .
Programme operator:	EPD Australasia Limited.
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General information

Programme information

Programme:	EPD Australasia, https://epd-australasia.com/ .
Address:	EPD Australasia Limited 315a Hardy Street Nelson 7010, New Zealand
Website:	www.epd-australasia.com
E-mail:	info@epd-australasia.com

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): 2019:14 Construction Products Version 1.2.5, 2022-11-01 Complementary Product Category Rules (c-PCR): c-PCR-001 Cement and Building Lime (EN 16908:2017+A1:2022), 2022-05-18
EPD Tool: GCCA's Industry EPD Tool for Cement and Concrete (V4.0), International version
Life Cycle Assessment (LCA)
LCA accountability: <i>Trent Alexander, General Manager, Southern Cross Cement</i>
Third-party verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: <input checked="" type="checkbox"/> EPD verification by individual verifier Third-party verifier: Jonas Bengtsson Edge Environment Pty Ltd Address: 119 Avoca Street, Randwick, NSW, 2031, Australia. Approved by: EPD Australasia Ltd
Procedure for follow-up of data during EPD validity involves third party verifier: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Data Reference Year: 1/7/22 – 30/6/23

Company information

Southern Cross Cement is a construction materials supplier focused on cementitious materials supporting the Growth of Queensland. Our Purpose-built silos store 40,000 tonnes of high quality cement products at the Port of Brisbane. With a capacity of up to 400,000 tonnes per annum, Southern Cross Cement is a significant supplier in the market.

Southern Cross Cement commenced operations in 2019 and is a joint venture between Brickworks Ltd, Neilsen Group and Neumann Group. Located at Port Drive & Seafarer St Port of Brisbane, QLD 4178 our facility operates 24 hours a day, 7 days a week. The business imports, stores and distributes high quality cement from a number of reputable sources located in South East Asia.

Southern Cross Cement created this EPD to ensure transparency in line with whole-life environmental impact assessment of its products.

Owner of the EPD: Southern Cross Cement Pty Ltd

Registered Address: 738-780 Wallgrove Rd
Horsley Park NSW 2175

Contact: Trent Alexander – General Manager

Email: trent.alexander@sccement.com.au

Description of the organisation: Cement Supplier

Product-related or management system-related certifications: ISO9001 Accredited

Name and location of site: Seafarers Street, Port of Brisbane, QLD

The EPD owner has the sole ownership, liability, and responsibility for the EPD. See the GPI and the PCR for other required company information. 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.

Product information

Product name

Southern Cross GP Cement

Product identification

General Purpose (Type GP) Cement

Product description

Type GP Cement can be used as a cementitious binder in a broad range of applications including: ready mixed concrete, precast concrete, mortars, renders and grouts.

Type GP cement is manufactured in accordance with AS 3972. It is produced to consistent quality standards from Portland Cement clinker, gypsum and mineral additions (up to 7.5%).

Type GP cement can be used on its own or in conjunction with other supplementary materials such as fly ash supplied in accordance with AS 3582.1. This EPD covers a specific product (GP Cement) from two sources of similar embodied carbon content.

UN CPC code

3744

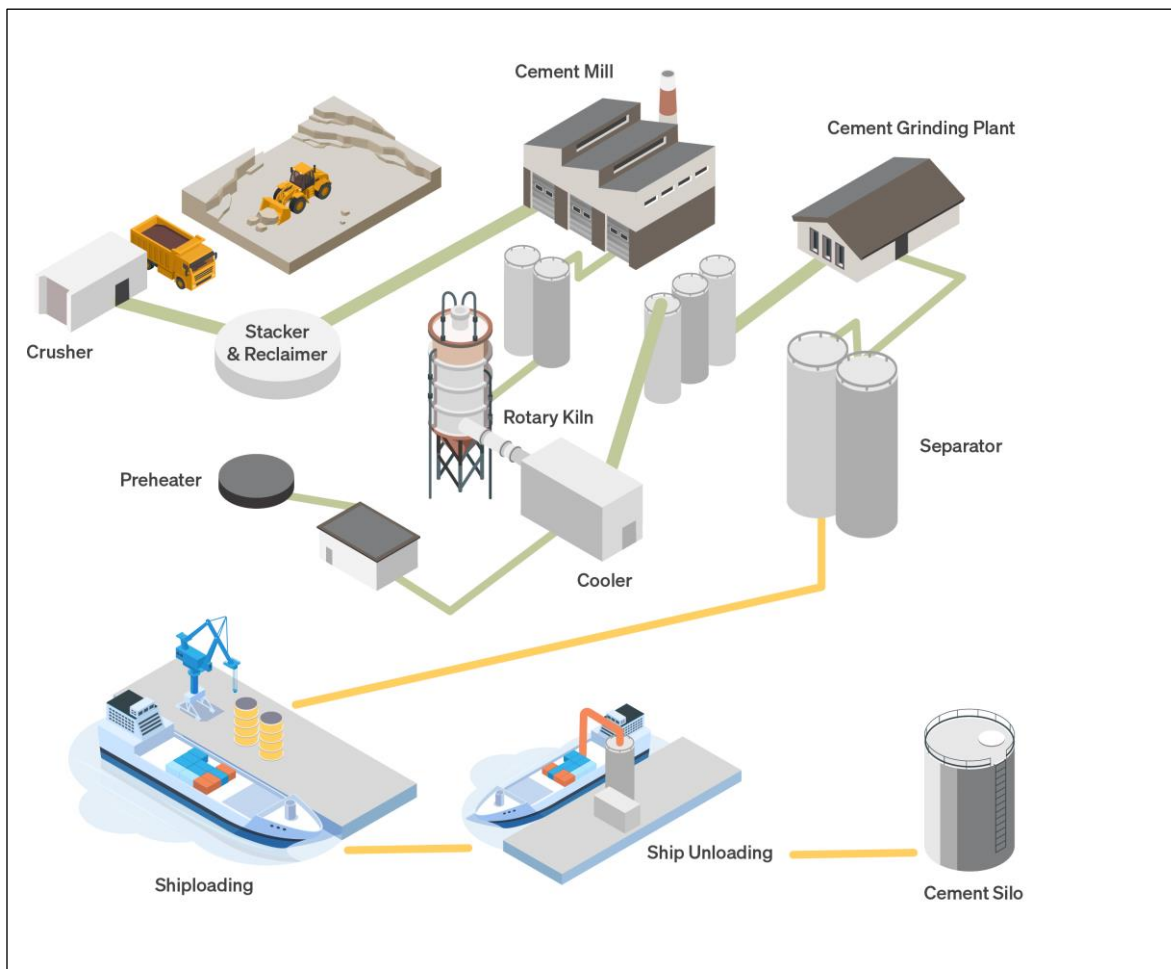
Product Composition

Nominal product composition of GP per tonne of cement.

Product Component	Weight (kg)	Post-Consumer recycled material (weight %)	Biogenic material (weight % and kg C/kg)
Clinker	920	0	0 resp. 0
High Grade Limestone	30	0	0 resp. 0
Gypsum	50	0	0 resp. 0

All materials required for manufacturing are delivered by trucks, trains or ships without packaging.

Southern Cross Cement Process Overview



Cement manufacturing involves a meticulous process that starts with the extraction of raw materials, primarily limestone, clay, sand, and iron ore, which are crushed and blended in specific proportions. This blend is heated in a kiln to around 1,400 degrees Celcius, forming a substance called clinker. The clinker is then ground into a fine powder with gypsum, enhancing its properties for use in construction. This finely ground powder, known as cement, serves as the binding agent in concrete, enabling structures to endure substantial loads and resist environmental elements, playing a pivotal role in modern construction.

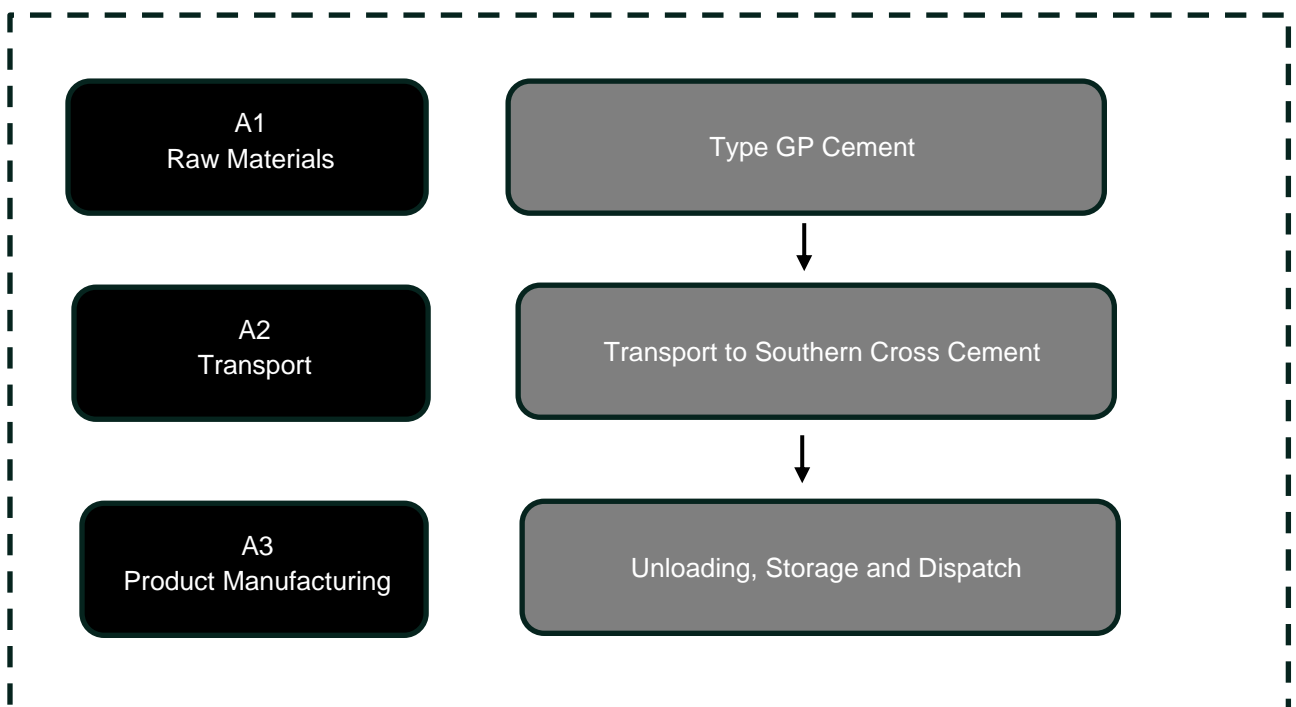
System Boundaries

This EPD covers the cradle to gate life cycle stages (A1–A3) of cement production.

This system includes the extraction and production of raw materials, transportation of raw materials to the clinker and cement plant, clinker and cement manufacturing process and treatment of waste produced as well as transport to Southern Cross Cement and unloading, storage and despatch activities.

Cement is used as a component in the manufacture of construction materials such as concrete and mortar and cannot be separated from this products at end of life. As such, processes related to the use stage and end of life are not accounted for in this EPD in accordance with EN 15804+A2.

System Diagram



Life Cycle Assessment (LCA) Information

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

	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

Geographical scope involves the manufacture of cement in either Vietnam or Indonesia (A1) and transport (A2) via bulk ship followed by unloading, storage and despatch (A3) by Southern Cross Cement in Brisbane.

The supply of the two cements by the two suppliers (Vietnam and Indonesia) to Southern Cross Cement is approximately equal and the environmental indicators reported in this EPD are numerical average results from the individual environmental indicators determined for the two Type GP cements in accordance with section 4.6.1 of PCR 2019:14 ver 1.2.5 for similar products.

The difference in the GWP-GHG results for modules A1-A3 between the reported result (average) and the results for the two individual cements (Vietnam and Indonesia) do not differ more than 10%.

Declared Unit

1 tonne

Reference Service Life

Not applicable

Time Representative

12 months – 01 July 2022 to 30 June 2023

Database and LCA software Used

GCCA Industry EPD Tool for Cement and Concrete (V4.0), International version. The life cycle inventory database used in the tool is the ecoinvent database (v3.5), cut-off system model. The ecoinvent LCI database is the most widely used LCI database worldwide and the reference database for a large number of EPDs and sector-specific LCI datasets.

Background Data

The data provided for use in this EPD has been taken directly from the Suppliers of product and services associated with the manufacture and delivery of cement to Southern Cross Cement, Port of Brisbane Australia.

The source of Electricity supply data is Australian Energy Statistics, Table 0 Electricity Generation by Fuel Type 2021-2022 (Department of Climate Change, Energy, the Environment and Water).

Energy usage data is monitored through site meters and energy billing information.

Queensland electricity generation, by fuel type, calendar year 2021

Fuel Type	%
Non-renewable Fuels	
Black Coal	65.12
Natural Gas	14.23
Oil Products	1.54
Total Non-renewable Fuels	80.89
Renewable Fuels	
Biomass	1.84
Wind	2.53
Hydro	1.54
Large Scale solar PV	4.97
Small Scale solar PV	8.23
Total Renewable	19.11

Data Quality

Information and data utilised in this document is correct and factual at time of development.

Primary data was collected from the clinker and cement manufacturers of Southern Cross Cement located in Vietnam and Indonesia. The environmental impacts from each of these sources was averaged for the purpose of this EPD.

Similar products from more than one manufacturing site can be considered represented by this EPD if the variation is less than 10% from an Average Result for the GWP-GHG environmental impact indicator for modules A1-A3 in accordance with PCR Version 1.2.5 (section 4.6.1).

Module	Input/Output	Data Source	Temporal Scope	Quality
A1	Cement	Vissai Vietnam PT Conch North Sulawesi GCCA EPD tool	2022	Medium
A2	Transport	Shipping Reports and Transport Distances	2022	High
A3	Electricity used for Manufacturing	Site electricity meters and billing information	2022	High

Cut off Rules

Life Cycle Analysis (LCA) data shall include a minimum of 95% of total inflows (mass and energy) per module with extrapolation used to achieve 100% completeness.

It has also been assumed that capital equipment and personnel costs have a minor impact that does not need to be included in the system boundary.

For clinker and cement production all input materials, fuels and use of electricity, carbonation and fuel emissions, other process emissions, water use and waste generation have been accounted for.

For cement unloading, storage and despatch use of electricity has been accounted for.

All materials required for manufacturing are delivered by trucks, trains or ships without packaging. Waste from the import and storage terminal is less than 1% of production and was therefore excluded from this LCA.

Based on this guidance all inflow and outflows have been accounted for.

Allocation Rules

No co-products were used in the manufacture of the Type GP cement and no allocation (mass or economic) was applied.

Assumptions

The key choices and assumptions in this EPD are:

- The environmental profiles are largely influenced by the primary data, which are considered medium to high quality.
- Transport distances have been calculated as a direct route from material source to plant.
- Electricity use is allocated to the Type GP cement based on actual electricity use by Southern Cross Cement.

- GP Cement compliant with AS3972 is the single specific product covered by this EPD. This product from dual manufacturing sources uses average results method for determination of final EPD data.

Environmental Indicators

Core Environmental Impact Indicators

- GWP-GHG (global warming potential, GHG)
- 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 (depletion potential of the stratospheric ozone layer)
- AP (acidification potential, accumulated exceedance)
- EP-freshwater (eutrophication potential, freshwater)
- EP-marine (eutrophication potential, marine)
- 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 deprivation potential)

Parameters Describing Resource Use

- 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)

Environmental Information Describing Waste Categories

- HWD (hazardous waste disposed)
- NHWD (non-hazardous waste disposed)
- RWD (radioactive waste disposed)

Environmental Information Describing Output Flows

- CRU (components for re-use)
- MFR (materials for recycling)
- MER (materials for energy recovery)
- EE (exported energy)

Additional Environmental Impact Indicators

- PM (potential incidence of disease due to PM emissions)
- IRP (potential human exposure efficiency relative to U235)
- ETP-fw (potential comparative toxic unit for ecosystems)
- HTP-c (potential comparative toxic unit for humans)
- HTP-nc (potential comparative toxic unit for humans)
- SQP (potential soil quality index)

Extra Indicators

- CC (emissions from calcination and removals from carbonation)
- CWRS (emissions from combustion of waste from renewable sources)
- CWNRS (emissions from combustion of waste from non-renewable sources)
- GWP-Prod (Removals and emissions associated with biogenic carbon content of the bio-based product)
- GWP-Pack (Removals and emissions associated with biogenic carbon content of the bio-based packaging)

Environmental Performance

Core Environmental Impact Indicators

Indicator	Unit	Total A1-A3
GWP-total	kg CO ₂ eq.	8.67E+02
GWP-GHG	kg CO ₂ eq.	8.67E+02
GWP-fossil	kg CO ₂ eq.	8.67E+02
GWP-biogenic	kg CO ₂ eq.	9.44E-02
GWP-luluc	kg CO ₂ eq.	9.68E-02
ODP	kg CFC 11 eq.	1.04E-05
AP	mol H ⁺ eq.	3.56E+00
EP-freshwater	kg PO ₄ eq.	1.55E-01
EP-marine	kg N eq.	9.70E-03
EP-terrestrial	mol N eq.	6.63E+00
POCP	kg NMVOC eq.	1.65E+00
ADP-minerals&metals	kg Sb eq.	2.22E-04
ADPF	MJ, net calorific value	4.09E+03
WDP	m ³ world eq. deprived	9.98E+01

*Per tonne of Cement Produced and imported

Parameters Describing Resource Use

Indicator	Unit	Total A1-A3
PERE	MJ, net calorific value	1.59E+02
PERM	MJ, net calorific value	0.00E+00
PERT	MJ, net calorific value	1.59E+02
PENRE	MJ, net calorific value	4.09E+03
PENRM	MJ, net calorific value	0.00E+00
PENRT	MJ, net calorific value	2.37E+03
SM	kg	0.00E+00
RSF	MJ, net calorific value	0.00E+00
NRSF	MJ, net calorific value	0.00E+00
FW	m ³	2.39E+00

*Per tonne of Cement Produced and imported

Environmental Information Describing Waste Categories

Indicator	Unit	Total A1-A3
HWD	kg	0.00E+00
NHWD	kg	1.15E-01
RWD	kg	0.00E+00

*Per tonne of Cement Produced and imported

Environmental Information Describing Output Flows

Indicator	Unit	Total A1-A3
CRU	kg	0.00E+00
MFR	kg	0.00E+00
MER	kg	0.00E+00
EE	MJ per energy carrier	0.00E+00

*Per tonne of Cement Produced and imported

Additional Environmental Impact Indicators

Indicator	Unit	Total A1-A3
PM	Disease incidence	1.88E-05
IRP	kBq U235 eq.	5.92E+03
ETP	CTUe	8.05E+01
HTPC	CTUh	1.79E-06
HTPNC	CTUh	4.26E-05
SQP	dimensionless	1.35E+03

Extra Indicators

Indicator	Unit	Total A1-A3
CC	kg CO ₂ eq.	4.83E+02
CWRS	kg CO ₂ eq.	0.00E+00
CWNRS	kg CO ₂ eq.	0.00E+00
GWP-prod	kg CO ₂	0.00E+00
GWP-pack	kg CO ₂	0.00E+00

*Per tonne of Cement Produced and imported

No recycled content is present in the manufacture of Southern Cross GP Cement

References

EN 15804:2012+A2:2019, Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products, European Committee for Standardization (CEN), Brussels, October 2019 AS/NZS 3972:2010, General purpose and blended cements.

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