ADVANCED READYMIX

ENVIRONMENTAL PRODUCT DECLARATION

In accordance with ISO 14025:2026 and EN 15804:2012+A2:2019/AC:2021 for

"S65/10/100" concrete, manufactured at Smithfield

Programme: The International EPD® System www.environdec.com
Programme operator: EPD International AB
Regional Programme: EPD Australasia www.epd-australasia.com
EPD Registration no. EPD-IES-0014037:001 | Version 1.0
Date of issue 2024-10-23 | Valid until 2029-10-23
Geographical scope: Australia

EPD of a single concrete product from one location
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.epd-australasia.com

EPD® THE INTERNATIONAL EPD® SYSTEM
AUSTRALASIA EPD® ENVIRONMENTAL PRODUCT DECLARATION
ECO PLATFORM EPD VERIFIED

Contents

Disclaimer

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.

Programme information and verification

An Environmental Product Declaration (EPD) is a standardised way of quantifying the potential environmental impacts of a product or system. EPDs are produced according to a consistent set of rules – Product Category Rules (PCR) – that define the requirements within a given product category. These rules are a key part of ISO 14025 as they enable transparency and comparability between EPDs. This EPD provides environmental indicators for a selected concrete product, manufactured by Advanced Readymix in Smithfield, New South Wales (NSW).

This EPD is a "cradle-to-gate plus modules C1-C4, D" declaration covering production and end-of-life life cycle stages.

This EPD is verified to be compliant with EN 15804. EPDs of construction products may not be comparable if they do not comply with EN15804. EPDs within the same product category but from different programs or utilising different PCR documents may not be comparable, see the disclaimer on the previous page.

Advanced Readymix, as the EPD owner, has the sole ownership, liability, and responsibility for the EPD.

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EPD Produced by:	**start2see Pty Ltd** 36 Renaissance Boulevard Mernda, VIC 3754, Australia Web: www.start2see.com.au Email: Rob.Rouwette@start2see.com.au Phone: +61 403 834 470	START2SEE LIFE CYCLE ASSESSMENTS	
EPD registration number:	EPD-IES-0014037:001	**Version:**	1.0
Date of publication:	2024-10-23	**Date of validity:**	2029-10-23 (5 years)
Reference year for data:	2021-07-01 – 2022-06-30		

CEN standard EN 15804 served as the core PCR

PCR:	PCR 2019:14 Construction Products, Version 1.3.4, 2024-04-30 (valid until 2025-06-20) C-PCR-003 (to 2019:14) Concrete and concrete elements, version 2024-04-30
PCR review was conducted by:	The Technical Committee of the International EPD® System. See www.environdec.com for a list of members. Last review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat www.environdec.com/contact
Independent third-party verification of the declaration and data, according to ISO 14025:	☒ EPD verification by individual verifier Third party verifier (approved by EPD Australasia): Angela Schindler, Umweltberatung Web: www.schindler-umwelt.de Email: angela@schindler-umwelt.de Phone: +49 07553 919 9456

About us

Advanced Readymix is a family-owned supplier of concrete to the Sydney area. Over the past 30 years, Advanced Readymix has grown to over 40 trucks and 3 concrete batch plants located in Seven Hills, Smithfield with Prestons being the one of the largest concrete plants in Sydney.

We supply all segments including domestic, commercial, industrial, civil and multi residential, specialising in high strength concrete for the precast market.

Advanced Readymix is known for providing quality and service to small backyard customers up to large Government projects.

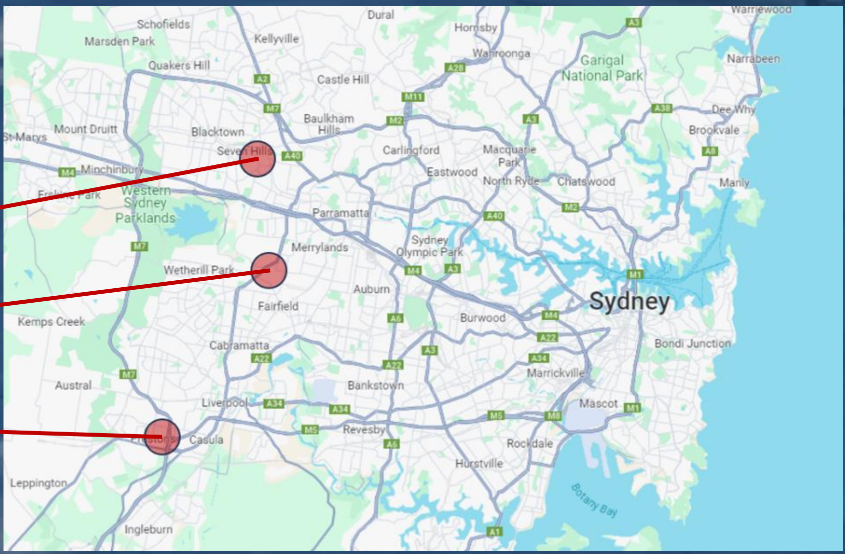
“No job is too large or too small”

Advanced Readymix currently operates three plants in Sydney, NSW:

Seven Hills

Smithfield

Prestons



Product description

Advanced Readymix specialises in manufacturing concrete, ranging in strength grade as per client and application requirements. The concrete products consist of a mixture of cementitious binder, supplementary cementitious materials, aggregates, natural sand, water and admixtures.

The product covered by this EPD is manufactured at Advanced Readymix's Smithfield plant in the western part of Sydney, NSW. The concrete is typically used in the construction of floors, walls, driveways, columns, foundations, etc.

The product code of the product included in this EPD, its strength grade and density are shown below. The product composition is presented in Table 1. For reasons of confidentiality, a range is provided.

Product code	Strength grade	Density
S65/10/100	65 MPa	2 302 kg/m^3

Table 1: Product content

Constituent	All products covered by our EPDs	Post-consumer material, weight %	Biogenic material, weight %	Biogenic material, kg C / declared unit
Density (kg/m³)	*2292 - 2401 kg/m³*			
Cement*	5-23%	0%	0%	0
Ground granulated blast furnace slag †	0-6%	0%	0%	0
Fly ash †	1-6%	0%	0%	0
Coarse aggregate †	39-45%	0%	0%	0
Manufactured sand †	0-15%	0%	0%	0
Natural sand †	14-39%	0%	0%	0
Admixtures# (may include oxides)	0.05-0.45%	0%	0%	0
Water	5-9%	0%	0%	0
Reinforcement fibres $	0-1%	0%	0%	0
Total	**100%**	**0%**	**0%**	**0**

** We use GP, SL and HES cements in our mixes, subject to product type and location. Cement contains traces of Chromium VI (hexavalent).*

† Crystalline-silica (quartz) may be a constituent of sand, crushed stone, gravel, blast furnace slag and fly ash used in any particular concrete mix.

 # Although admixtures (Plasticisers / Water reducers, colouring pigments, retarding and accelerating admixture) are below the mass cut-off, they have been considered in this LCA as they may exceed the environmental cut-off.

$ The reinforcement fibre content of the product covered by this EPD is: n/a

In this LCA, both fly ash and slag are considered secondary materials.

The product, as supplied, is non-hazardous. The product included in this EPD does not contain any substances of very high concern as defined by European REACH regulation* in concentrations >0.1% (m/m). Dust from this product is classified as Hazardous according to the Approved Criteria for Classifying Hazardous Substances 3rd Edition (NOHSC 2004). Concrete products are classified as non-dangerous goods according to the Australian Code for the Transport of Dangerous Goods by Road and Rail. When concrete products are cut, sawn, abraded or crushed, dust is created which contains crystalline silica, some of which may be respirable (particles small enough to go into the deep parts of the lung when breathed in), and which is hazardous. Exposure through inhalation should be avoided.

The product code for pre-mix concrete is UN CPC 375 (Articles of concrete, cement and plaster) and ANZSIC 20330 (Concrete – ready mixed – except dry mix).

* Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals. (ECHA 2024)

Technical Compliance

Advanced Readymix concrete products comply with relevant technical specifications as per AS 1379:2007 Specification and supply of concrete.

Declared unit

"1 cubic metre (m³) of ready-mixed concrete, as ordered by our clients"

Scope of the Environmental Product Declaration

This EPD covers life cycle stages A1-A3, C1-C4 and D. This EPD covers the processes that occur in as many of the product's life cycle stages as could be effectively modelled. Stages A4, A5 and B1-B7 have not been included as these are better defined at building or structure level.

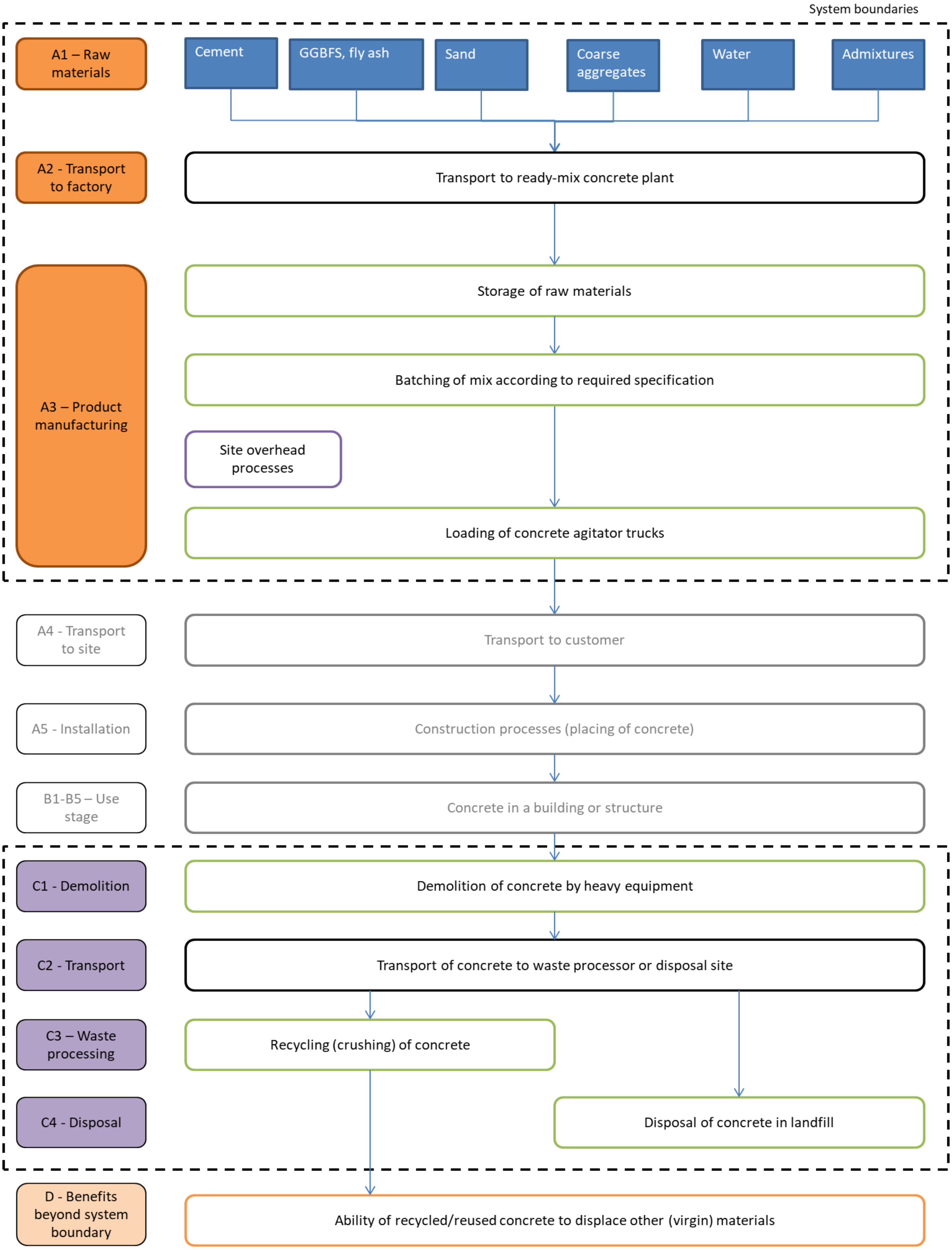
Table 2: Scope of EPD

Stages	Product Stage			Construction Stage		Use Stage							End-of-life Stage				Benefits beyond system boundary
	Raw Materials	Transport	Production	Transport	Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction/Demolition	Transport	Waste Processing	Disposal	Reuse, recovery, recycling potential
Modules	**A1**	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
				Scenario		Scenario							Scenario				Scenario
Modules Declared	✓	✓	✓	ND	ND	ND	ND	ND	ND	ND	ND	ND	✓	✓	✓	✓	✓
Geography	AU GLO	AU	AU										AU	AU	AU	AU	AU
Share of specific data	>90%																
Variation products	0%																
Variation sites	0%																

✓ = module is included in this study

ND = module is not declared. When a module is not accounted for, the stage is marked with "ND" (Not Declared). ND is used when a typical scenario cannot be defined.

Figure 3 – Flow diagram of main ready-mix concrete production processes, life cycle stages and visualization of system boundaries



Product Stage (A1-A3)

Raw Materials – Module A1

Extraction and processing of raw materials results in environmental impacts from the use of energy and resources, as well as from process emissions and waste.

- Cement is produced from clinker (made from limestone) and gypsum.
- Aggregates and natural sand are extracted from quarries.
- Supplementary Cementitious Materials (SCM): Fly ash, GGBFS (ground granulated blast furnace slag) are rest products from electricity generation and steel production, respectively.
- Admixtures are specialised chemical formulations that are typically produced by blending selected ingredients.

Transportation – Module A2

Raw materials are typically transported from suppliers to our site via (articulated) trucks. Transport of raw materials has been included in the LCA based upon actual transport modes and distances relevant to Smithfield.

Manufacturing – Module A3

Ready-mix concrete products are manufactured by mixing the raw materials in selected quantities for each mix design.

The “**Construction process stage**” and “**Use stage**” have been excluded from the life cycle assessment, as the ready-mix concrete can be used for a range of different applications for which the use scenarios are unknown. The impacts of these stages are best determined at project level.

End of life stage (C1-C4)

The end-of-life modules for pre-mix concrete are based on generic scenarios. The scenarios included are currently in use and are representative for one of the most probable alternatives.

Module C1 covers demolition of the concrete at the end of its service life. We have used the end-of-life scenario representative for NSW building & demolition materials products based on the National Waste Report 2022 (NWR 2022). This scenario implies that 79.6% of the concrete is recycled and the remaining 20.4% of the concrete is sent to landfill.

Module C2 comprises the transport from the demolition site to a recycling centre or landfill site (50km). Module C3 encompasses the recycling process (i.e. crushing of concrete), while Module C4 represents disposal of concrete in a landfill site.

The concrete reaches end-of-waste status when it is crushed and stockpiled as "recycled crushed concrete" (RCC) aggregates. Crushed concrete is assumed to substitute primary (quarried) material without needing further processing. Note: We assumed that any reinforcement fibres within concrete are not specifically recovered and separated but remain mixed with the recycled concrete material.

The end-of-life scenario is based on the density of the concrete (2 302 kg/m^3). This was done to present a correction for parameters PERM and PENRM in module C3 for each individual mix design. The corrections are based on the primary energy used as material (in admixtures), multiplied by the end-of-life recycling percentage.

Due to high uncertainty in the parameters and lack of data, CO_2-uptake (carbonation) has not been included at end-of-life.

Resource recovery stage (D)

Module D includes any benefits and loads from net flows leaving the product system (that have passed the end-of-waste state). For this EPD, any material collected for recycling and processed in Module C3, is considered to go through to Module D. We have assumed that Recycled Crushed Concrete aggregates (the output of module C3) replace virgin aggregates (crushed rocks) in module D.

Per cubic metre of concrete, module D credits the avoided impacts for 1.87 tonnes of crushed aggregates. Note: If reinforcement fibres are used, they do not affect the outcome in module D because the fibres are not recovered as steel or plastic in module C3.

Table 3: End-of-life scenario parameters

Processes	Quantity per m^3 of concrete	Unit
Collection process specified by type	2 302 0	kg collected separately kg collected with mixed construction waste
Transport from demolition site to recovery / disposal sites	50	km transport
Recovery system specified by type	0 1 833 0	kg for re-use kg for recycling kg for energy recovery
Disposal to landfill	470	kg product or material for final deposition
Assumptions for scenario development	142	MJ of diesel/m^3 for the demolition process (C1)
	70	MJ of diesel/m^3 for the recycling process (C3)

Life Cycle Assessment (LCA) Methodology

Background Data

Primary data covers the 2022 financial year (1 July 2021 – 30 June 2022) and has been sourced from Advanced Readymix. Background data is predominantly sourced from EPDs, AusLCI and the AusLCI shadow database. Data for cement has been sourced from the LCA model underpinning our supplier's EPD (Boral 2022). Data for admixtures has been sourced from EPDs published by EFCA (EFCA 2021a, 2021b, 2023). As a result, the vast majority of the environmental profile of our products is based on life cycle data less than three years old. Background data used is less than 10 years old.

Methodological choices have been applied in line with EN 15804:2012+A2:2019; deviations have been recorded.

Allocation

The key processes that require allocation are:

- Production of concrete mixes: All shared processes are attributed to concrete products based on their volume.
- Fly ash: all environmental impacts of the power plant have been allocated to the main product: electricity. Fly ash has only received the burdens of the transport to our site.
- Blast Furnace Slag (BFS): BFS is a by-product from steelmaking. We have used the AusLCI data for BFS ('Blast Furnace Slag allocation, at steel plant / AU U'), which contain impacts from pig iron production allocated to blast furnace slag using economic allocation. One tonne of slag equals the environmental impact of 0.0127 tonnes of pig iron. Drying of slag (using 769 MJ of natural gas per tonne) and milling of slag (using 50 kWh/t electricity) is included.
- Steel fibres: This product does not contain steel fibres.

Allocation approaches may have a material effect on concrete products containing fly ash and/or ground granulated blast furnace slag.

Cut-off criteria

- The cut-off criteria applied are 1% of renewable and non-renewable primary energy usage, 1% of the total mass input of a process and 1% of environmental impacts.
- The contribution of capital goods (production equipment and infrastructure) and personnel is excluded, as these processes are non-attributable and they contribute less than 10% to GWP-GHG.

Key assumptions

- The concrete composition of each product is provided by Advanced Readymix and has been accepted as is.
- Cement data are taken from the LCA model underpinning our supplier's EPD (Boral 2022).. Emissions of secondary fuels have been attributed to clinker production; i.e. the gross value is used in the EPD.
- Admixture data are taken from generic EPDs. Additional environmental impact indicators are not declared in the admixture EPDs, which results in underreporting of these indicators.
- Allocation approaches may have a material effect on concrete products containing fly ash and/or ground granulated blast furnace slag.
- Electricity has been modelled for core processes using adjusted AusLCI data to represent the estimated residual electricity grid mix in Australia. This is done by removing renewables from the Australian Energy Statistics 2023 data (Table O1.1). The GWP-GHG of the electricity is 0.91 kg CO_2e / kWh (aligned with NGA 2023). The proxy residual grid mix is made up of black coal (53.9%), brown coal (17.3%), natural gas (26.3%), and oil products (2.5%). Given the low contribution of electricity consumption to the GWP emissions, the selection of the electricity grid mix does not have a material impact on the results.
- The end-of-life scenario is based on landfill and recycling rates for building and demolition materials in New South Wales, as per the National Waste Report 2022 (NWR 2022), table 37.

Life Cycle Assessment (LCA) indicators

An LCA serves as the foundation for this EPD. An LCA analyses the production systems of a product. It provides comprehensive evaluations of all upstream and downstream energy inputs and outputs. The results are provided in a form which covers a range of environmental impact categories.

Table 4: Environmental indicators legend (EN 15804+A2)

Core indicators	Acronym	Unit
Climate change – total	GWP-total	kg CO_2 equivalent
Climate change – fossil	GWP-fossil	kg CO_2 equivalent
Climate change – biogenic	GWP-biogenic	kg CO_2 equivalent
Climate change – land use and land use change	GWP-luluc	kg CO_2 equivalent
Ozone layer depletion	ODP	kg CFC-11 equivalent
Acidification	AP	mol H^+ equivalent
Eutrophication aquatic freshwater	EP-freshwater	kg P equivalent
Eutrophication aquatic marine	EP-marine	kg N equivalent
Eutrophication terrestrial	EP-terrestrial	mol N equivalent
Photochemical ozone formation	POCP	kg NMVOC equivalent
Abiotic depletion potential – elements[2]	ADP minerals & metals	kg Sb equivalent
Abiotic depletion potential – fossil fuels[2]	ADP fossil	MJ, net calorific value
Water use[2]	WDP	m^3 world equivalent deprived
Additional indicators	**Acronym**	**Unit**
Global Warming Potential – Greenhouse gases	GWP-GHG	kg CO_2 equivalent
Particulate matter emissions	PM	disease incidence
Ionising radiation, human health[1]	IRP	kBq U235 equivalent
Ecotoxicity (freshwater)[2]	ETP-fw	CTUe
Human toxicity, cancer effects[2]	HTP-c	CTUh
Human toxicity, non-cancer effects[2]	HTP-nc	CTUh
Land use related impacts / soil quality[2]	SQP	- (dimensionless)
Additional GHG indicator	**Acronym**	**Unit**
Carbon footprint in line with IPCC AR5[3]	**GWP-GHG (IPCC AR5)**	**kg CO_2 equivalent**

[1] 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 some construction materials, is also not measured by this indicator.

[2] The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

[3] **Note regarding various GWP indicators:** GWP-total is calculated using the European Union's Joint Research Centre's characterisation factors (CFs) based on the "EF 3.1 package" for CFs to be used in the EU's Product Environmental Footprint (PEF) framework. CFs listed by JRC are based on the IPCC AR6 method (IPCC 2021) and include indirect radiative forcing, which results in higher numerical Global Warming Potential (GWP) values than the CFs in the internationally accepted (IPCC 2013). The GWP-GHG indicator is identical to GWP-total except that the CFs for biogenic CO_2 are set to zero. The GWP-GHG indicator in PCR 2019:14 v1.3.4 differs from the GWP-GHG in earlier (pre v1.3) PCR 2019:14 versions. The "GWP-GHG (IPCC AR5)" indicator is determined using the IPCC AR5 GWPs with a 100-year time horizon (IPCC 2013). This indicator is aligned with Australia's greenhouse gas reporting frameworks.

Table 5: Legend for parameters describing resource use, waste and output flows

Parameter	Acronym	Unit
Parameters describing resource use		
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	PERE	MJ_{NCV}
Use of renewable primary energy resources used as raw materials	PERM	MJ_{NCV}
Total use of renewable primary energy resources	PERT	MJ_{NCV}
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	PENRE	MJ_{NCV}
Use of non-renewable primary energy resources used as raw materials	PENRM	MJ_{NCV}
Total use of non-renewable primary energy resources	PENRT	MJ_{NCV}
Use of secondary material	SM	kg
Use of renewable secondary fuels	RSF	MJ_{NCV}
Use of non-renewable secondary fuels	NRSF	MJ_{NCV}
Use of net fresh water	FW	m^3
Waste categories		
Hazardous waste disposed	HWD	kg
Non-Hazardous waste disposed	NHWD	kg
Radioactive waste disposed	RWD	kg
Output flows		
Components for re-use	CRU	kg
Materials for recycling	MFR	kg
Materials for energy recovery	MER	kg
Exported energy	EE	MJ

Table 6: Legend for EN 15804+A1 indicators

Indicator	Acronym	Unit
Global warming potential	GWP	kg CO_2 equivalent
Ozone layer depletion potential	ODP	kg CFC-11 equivalent
Acidification potential	AP	kg SO_2 equivalent
Eutrophication potential	EP	kg PO_4^{3-} equivalent
Photochemical oxidation (Photochemical ozone creation) potential	POCP	kg ethylene equivalent
Abiotic depletion potential - elements	ADPE	kg Sb equivalent
Abiotic depletion potential – fossil fuels	ADPF	MJ_{NCV}

Results: Environmental profile

The following section presents the results for each Life Cycle Assessment module. The results have been calculated (based on the EFv3.1 set of characterisation factors) using Simapro software v9.5.0.0. To separate the use of primary energy into energy used as raw material and energy used as energy carrier, Option B from Annex 3 of PCR 2019:14 has been applied.

Please consider the following mandatory statements when interpreting the results:

" 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."

"***The use of the results of modules A1-A3 (A1-A5 for services) without considering the results of module C is discouraged.***"

S65/10/100, Smithfield

The environmental indicators are expressed per m^3 of concrete.

Table 7: **Environmental indicators EN 15804+A2, ready mixed concrete, per m^3**

Environmental Indicator	Unit	Module A1-A3	Module C1	Module C2	Module C3	Module C4	Module D
Core Indicators							
GWP-total	kg CO_2-eq.	4.84E+02	1.17E+01	1.47E+01	7.53E+00	1.11E+00	-1.82E+01
GWP-fossil	kg CO_2-eq.	4.84E+02	1.17E+01	1.47E+01	7.52E+00	1.11E+00	-1.82E+01
GWP-biogenic	kg CO_2-eq.	4.87E-01	8.09E-04	9.11E-04	7.17E-03	8.98E-05	-3.57E-02
GWP-luluc	kg CO_2-eq.	1.78E-03	5.84E-06	6.96E-06	3.49E-06	5.40E-07	-2.80E-06
ODP	kg CFC11-eq.	6.20E-06	1.95E-06	2.32E-06	9.50E-07	1.82E-07	-6.20E-07
AP	mol H+ eq.	1.49E+00	1.34E-01	1.29E-01	2.07E-02	2.66E-03	-6.64E-02
EP-freshwater	kg P eq.	9.00E-05	1.62E-06	8.86E-07	5.58E-06	1.52E-07	-1.31E-05
EP-marine	kg N eq.	5.63E-01	5.83E-02	4.08E-02	3.68E-03	4.79E-04	-1.11E-02
EP-terrestrial	mol N eq.	6.12E+00	6.40E-01	4.47E-01	4.02E-02	5.24E-03	-1.20E-01
POCP	kg NMVOC eq.	1.49E+00	1.71E-01	1.09E-01	1.07E-02	1.41E-03	-3.15E-02
ADP minerals & metals[2]	kg Sb eq.	4.08E-06	1.44E-08	1.71E-08	1.87E-06	1.31E-09	-2.67E-06
ADP fossil[2]	MJ (NCV)	2.91E+03	1.70E+02	2.02E+02	1.07E+02	1.58E+01	-2.60E+02
WDP[2]	m^3 world eq. deprived	2.95E+02	1.09E+00	1.30E+00	2.32E+00	1.02E-01	-1.23E+02
Additional indicators							
GWP-GHG	kg CO_2-eq.	4.84E+02	1.17E+01	1.47E+01	7.53E+00	1.11E+00	-1.82E+01
PM	Disease incidence	1.32E-05	3.55E-06	7.29E-07	1.38E-07	1.41E-08	-5.56E-07
IRP[1]	kBq U235 eq.	2.37E-03	2.49E-04	2.95E-04	1.52E-03	2.30E-05	-1.65E-03
ETP-fw[2]	CTUe	1.32E+02	3.77E+01	4.47E+01	1.85E+01	3.45E+00	-1.25E+01
HTP-c[2]	CTUh	1.83E-08	4.72E-10	6.32E-11	1.58E-10	8.80E-12	-7.90E-10
HTP-nc[2]	CTUh	1.52E-06	2.52E-09	1.21E-09	1.03E-09	1.06E-10	-4.99E-09
SQP[2]	-	4.54E+02	8.17E-01	9.08E-01	2.54E+01	2.62E+01	-3.73E+02
Carbon footprint							
GWP-GHG (IPCC AR5)	**kg CO_2-eq.**	**484**	**11.7**	**14.7**	**7.53**	**1.11**	**-18.2**

Footnotes:

[1] 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 some construction materials, is also not measured by this indicator.

[2] The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

Table 8: **Parameters, ready mixed concrete, per m^3**

Parameter	Unit	Module A1-A3	Module C1	Module C2	Module C3	Module C4	Module D
PERE	MJ_{NCV}	1.93E+02	2.63E-01	2.90E-01	1.86E+00	3.10E-02	-1.48E+01
PERM	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ_{NCV}	1.93E+02	2.63E-01	2.90E-01	1.86E+00	3.10E-02	-1.48E+01
PENRE	MJ_{NCV}	2.91E+03	1.70E+02	2.02E+02	1.07E+02	1.58E+01	-2.60E+02
PENRM	MJ_{NCV}	1.63E+01	0.00E+00	0.00E+00	-1.30E+01	0.00E+00	0.00E+00
PENRT	MJ_{NCV}	2.93E+03	1.73E+02	2.02E+02	9.44E+01	1.58E+01	-2.60E+02
SM	kg	9.55E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ_{NCV}	1.46E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	4.14E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	2.78E+00	2.47E-02	2.93E-02	3.82E-02	2.30E-03	-2.85E+00
HWD	kg	1.07E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NHWD	kg	1.38E+00	7.79E-04	8.59E-04	5.24E-03	4.70E+02	-4.37E-02
RWD	kg	2.52E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	2.38E+01	0.00E+00	0.00E+00	1.83E+03	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
EE	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 9: **Environmental indicators EN 15804+A1*, ready mixed concrete, per m^3**

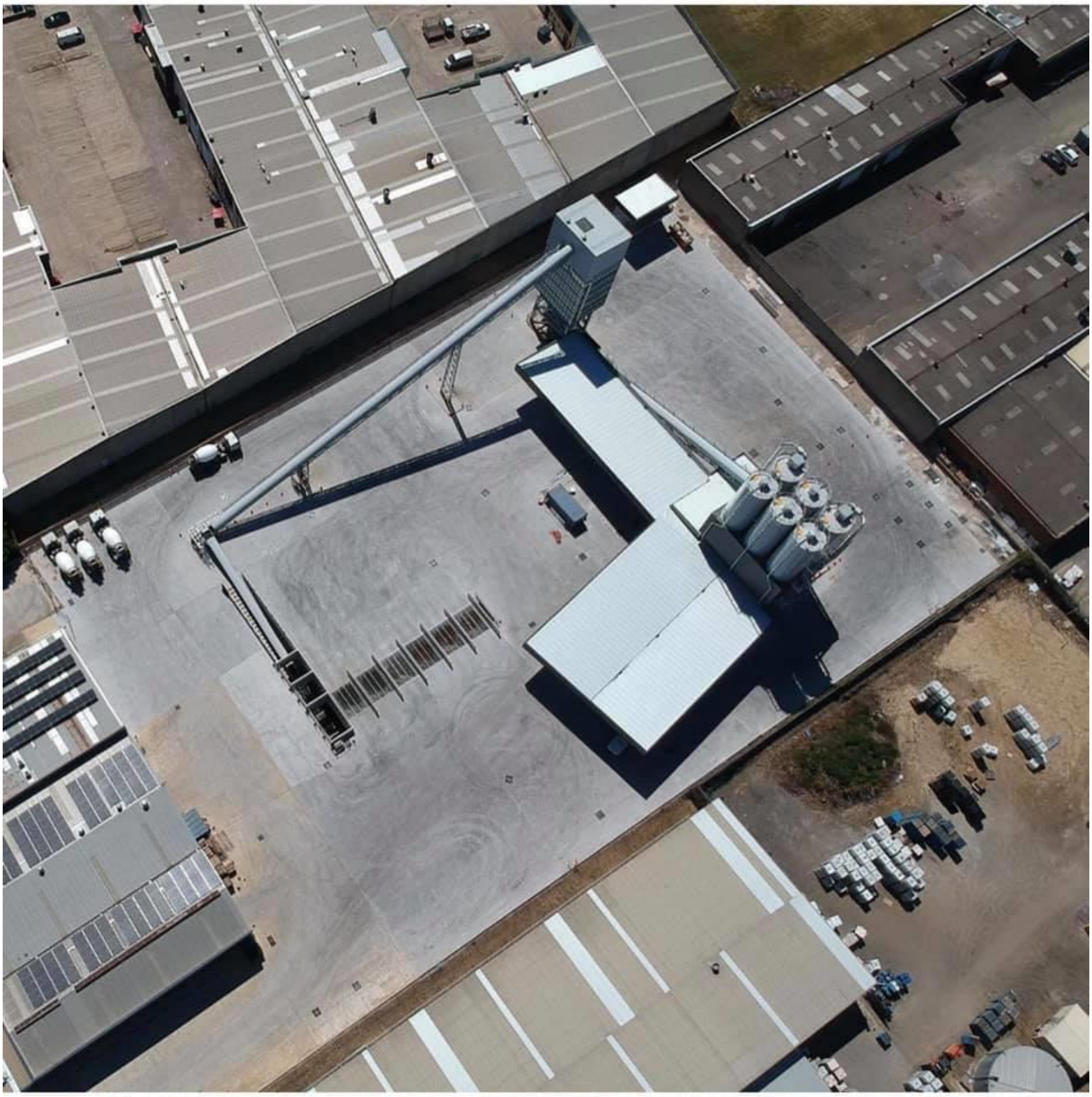
Environmental Indicator	Unit	Module A1-A3	Module C1	Module C2	Module C3	Module C4	Module D
GWP	kg CO_2 eq	4.84E+02	1.17E+01	1.47E+01	7.50E+00	1.11E+00	-1.81E+01
ODP	kg CFC11 eq	4.91E-06	1.54E-06	1.84E-06	7.50E-07	1.44E-07	-4.90E-07
AP	kg SO_2 eq	8.17E-01	9.53E-02	7.17E-02	1.31E-02	2.14E-03	-2.09E-02
EP	kg PO_4^{3-} eq	1.92E-01	1.96E-02	1.37E-02	1.28E-03	1.65E-04	-3.86E-03
POCP	kg C_2H_4 eq	3.05E-02	9.34E-03	4.63E-03	7.30E-04	1.07E-04	-1.44E-03
ADPE	kg Sb eq	9.48E-06	1.46E-08	1.73E-08	1.87E-06	1.33E-09	-2.68E-06
ADPF	MJ_{NCV}	2.92E+03	1.70E+02	2.02E+02	1.07E+02	1.58E+01	-2.60E+02

* Note: the indicators and characterisation methods are from EN 15804:2012+A1:2013, but other LCA rules (system boundaries, allocation, etc.) are according to EN 15804:2012+A2:2019; i.e., the results of the "A1 indicators" shall not be claimed to be compliant with EN 15804:2012+A1:2013

References

Boral 2022	EPD of Bulk Cement and Cementitious Products (Geographical scope: NSW), EPD Australasia. EPD Declaration number S-P-02322, issued 2022-02-22 (version 1.0), based on EN 15804+A2, PCR 2019:14 and c-PCR-001; EPD owner: Boral.
AS 1379	Specification and supply of concrete, prepared by Committee BD-049 Manufacture of Concrete, published on 20 September 2007 by Standards Australia, Sydney
AusLCI 2023	Australian Life Cycle Inventory database v1.42 published by the Australian Life Cycle Assessment Society, 2023
ECHA 2024	European Chemicals Association, Candidate List of substances of very high concern for Authorisation, published in accordance with Article 59(10) of the REACH Regulation, Helsinki Accessed on 1 June 2024 from: https://echa.europa.eu/candidate-list-table
EFCA 2021a	EPD of Retarders, IBU EPD Declaration number EPD-EFC-20210195-IBG1-EN, issued 2021-12-16, based on EN 15804 and PCR for concrete admixtures; EPD owner: EFCA - European Federation of Concrete Admixtures Associations
EFCA 2021b	EPD of Set Accelerators, IBU EPD Declaration number EPD-EFC-20210194-IBG1-EN, issued 2021-12-16, based on EN 15804 and PCR for concrete admixtures; EPD owner: EFCA - European Federation of Concrete Admixtures Associations
EFCA 2023	EPD of Plasticizer and superplasticizer, IBU EPD Declaration number EPD-EFC-20210198-IBG2-EN, issued 2023-08-14, based on EN 15804 and PCR for concrete admixtures; EPD owner: EFCA - European Federation of Concrete Admixtures Associations
Environdec 2024a	International EPD System, General Programme Instructions for the International EPD System, Version 5.0.0, 19 June 2024
Environdec 2024b	c-PCR-003 Concrete and concrete elements (EN 16757:2022), Product category rules for concrete and concrete elements, version 30 April 2024
EN 15804+A2	EN 15804:2012+A2:2019/AC:2021, Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products, European Committee for Standardization (CEN), Brussels, August 2021
EN 15804+A1	Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products, European Committee for Standardization (CEN), Brussels, November 2013
ISO 14025	Environmental labels and declarations - Type III environmental declarations - Principles and procedures. International Organization for Standardization, Geneva, Switzerland, 2006
ISO 14040	Environmental management - Life cycle assessment - Principles and framework. International Organization for Standardization, Geneva, Switzerland, 2006
ISO 14044	Environmental management - Life cycle assessment - Requirements and guidelines. International Organization for Standardization, Geneva, Switzerland, 2006
NGA 2023	Department of Climate Change, Energy, the Environment and Water. Australian National Greenhouse Accounts Factors, Commonwealth of Australia, August 2023
NOHSC 2004	National Occupational Health and Safety Commission (NOHSC), Approved Criteria for Classifying Hazardous Substances, 3rd Edition, Commonwealth of Australia, October 2024
NWR 2022	Blue Environment, National Waste Report 2022, prepared for The Department of Climate Change, Energy, the Environment and Water, Final version 1.2, 16 December 2022 (updated 10 February 2023)
PCR 2019:14	Product category rules for Construction products (EN 15804:A2), registration number 2019:14, version 1.3.4, published on 30 April 2024.

ADVANCED READYMIX



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