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MAWSONS
Concrete & Quarries

Environmental Product Declaration

in accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021

N2020STD concrete

manufactured in Cluster 1 (Echuca, Moama Country Concrete, Rochester, Tongala)

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EPD of a single product from a manufacturer (from multiple locations).
An EPD may be updated or depublished if conditions change.
To find the latest version of the EPD and to confirm its validity, see www.environdec.com

EPD INTERNATIONAL EPD SYSTEM

AUSTRALASIA EPD® INTERNATIONAL EPD SYSTEM

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Disclaimer

EPDs within the same product category but published in different EPD programmes, may not be comparable. For two EPDs to be comparable, they shall be based on the same PCR (including the same first-digit 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 identical scope in terms of included life-cycle stages (unless the excluded life-cycle stage is demonstrated to be insignificant); apply identical impact assessment methods (including the same version of characterisation factors); and be valid at the time of comparison. For further information about comparability, see EN15804 and ISO14025.

General information

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 single product, manufactured in Cluster 1 (Echuca, Moama Country Concrete, Rochester, Tongala), Australia.

This EPD is a "cradle-to-gate with modules C1-C4, D" declaration covering production of concrete products - including its supply chain - 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.

E.B. Mawson and Sons Pty. Ltd. (Mawsons) as the EPD owner, has the sole ownership, liability, and responsibility for the EPD.

EPD Program Operator (Licensee)	**EPD Program Operator:** **EPD International AB** Box 210 60, SE-100 31 Stockholm, Sweden E-mail: support@environdec.com	**Licensee:** **EPD Australasia Limited** Address: 6 Cube Court Richmond 7020, New Zealand Web: www.epd-australasia.com Email: info@epd-australasia.com	EPD INTERNATIONAL EPD SYSTEM AUSTRALASIA EPD® INTERNATIONAL EPD SYSTEM
EPD registration number:	EPD-IES-0021008:001	**Version:**	Original version of the EPD
Published:	2026-07-31	**Valid until:**	2031-07-30 (5 years)
Reference year for data:	2023-07-01 – 2024-06-30 (mix design is current in 2026)		

Product Category Rules (PCR)	CEN standard EN 15804 served as the core Product Category Rules (PCR)
PCR:	PCR 2019:14 Construction Products, Version 2.0.1, 2025-06-05 (valid until 2030-04-07) c-PCR-003 Concrete and concrete elements, version 2025-04-08
PCR review was conducted by:	The Technical Committee of the International EPD System. See www.environdec.com for a list of members. Review chair: Rob Rouwette | start2see (chair), Noa Meron | thinkstep-anz (co-chair). The review panel may be contacted via the Secretariat www.environdec.com/contact.
Third-party verification:	Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☒ Individual EPD verification without a pre-verified LCA/EPD tool
Third party verifier: **Approved by EPD Australasia Ltd**	Angela Schindler, Umweltberatung Web: www.schindler-umwelt.de Email: angela@schindler-umwelt.de Phone: +49 07553 919 9456
Procedure for follow-up of data during EPD validity involves third-party verifier:	☐ Yes ☒ No

Information about the EPD owner

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E.B. Mawsons & Sons Pty Ltd is a leading supplier of quality concrete and quarry products across northern Victoria and southern New South Wales. Since 1912, the family-run company has been respectful of the natural environment and the regional communities in which it operates. People are at the heart of the business and the development, empowerment and integrity of its staff underpins its success. Mawsons strive to work safely and provide products and services in a sustainable manner. In September 2020 Mawsons switched to 100% renewable electricity across workshops, offices, quarries and concrete plants. This move has dramatically reduced Mawsons' overall carbon emissions[1]. In addition to the use of renewable electricity, Mawsons recycle concrete, quarry products, sand and water. Working alongside the natural beauty of the Murray River for more than 114 years, Mawsons understands the critical importance of environmental sustainability to securing the future of regional Victoria and our newer locations in NSW. Mawsons can meet customer needs from our 36 quarries and pits, 46 concrete plants, and 7 landscaping centres. We also operate mobile crushing and screening equipment and have an extensive fleet of concrete, cement, and quarry delivery trucks. We will continue expanding our network and improving our performance to contribute to a prosperous and sustainable future for the communities in which we operate.

[1] Note: Due to the strict requirements of the EPD Program regarding the use of renewable electricity in the model, we have not yet implemented this in the underlying LCA, leading to a conservative outcome for the carbon footprint of our concrete products. We will continue working on improving our records and the LCA model to reflect this in future updates.

Product information

Mawsons supplies specialised premixed concrete products including:

- Stabilised Sand Products
- Deep Pile Foundations
- Heavy Industrial Pavements & High-Strength Structural Mixes
- Industrial Concrete Slabs
- Bulk Pour Concrete Mixes
- Coloured Concrete Mixes
- Exposed Concrete Mixes
- Polished Concrete Mixes
- Blockfill Mixes
- Fibre reinforced concrete mixes
- Flowable Fills
- Thermal backfill
- Grout mixes
- Kerb & Channel mixes
- Precast concrete mixes
- VicRoads (DTP) registered mixes
- TfNSW registered mixes
- Post Tensioned mixes
- CFA Piling mixes
- Tremie Piling mixes
- Shotcrete mixes
- Water retaining
- Waterproofing concrete mixes

This EPD covers N2020STD manufactured at Echuca

Product code(s)	Strength grade	Density
N2020STD	20 MPa	2 357 kg/m^3

Technical compliance

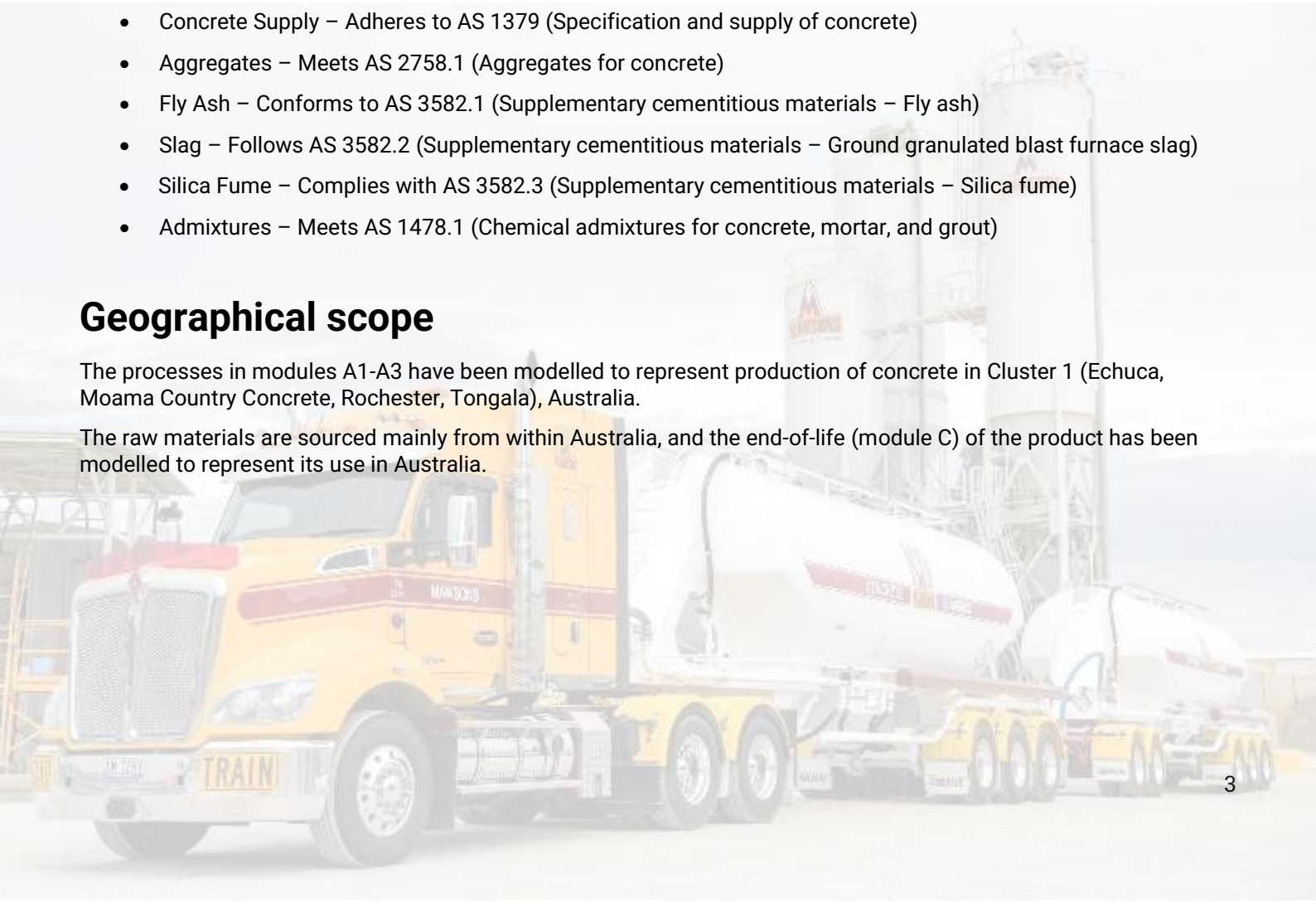
Mawsons ensures its products meet strict Australian Standards (AS) to maintain quality, durability, and performance across construction applications.

- Cement – Complies with AS 3972 (General Purpose and Blended Cements)
- Concrete Supply – Adheres to AS 1379 (Specification and supply of concrete)
- Aggregates – Meets AS 2758.1 (Aggregates for concrete)
- Fly Ash – Conforms to AS 3582.1 (Supplementary cementitious materials – Fly ash)
- Slag – Follows AS 3582.2 (Supplementary cementitious materials – Ground granulated blast furnace slag)
- Silica Fume – Complies with AS 3582.3 (Supplementary cementitious materials – Silica fume)
- Admixtures – Meets AS 1478.1 (Chemical admixtures for concrete, mortar, and grout)

Geographical scope

The processes in modules A1-A3 have been modelled to represent production of concrete in Cluster 1 (Echuca, Moama Country Concrete, Rochester, Tongala), Australia.

The raw materials are sourced mainly from within Australia, and the end-of-life (module C) of the product has been modelled to represent its use in Australia.



Content declaration

The product composition is presented in Table 1. For reasons of confidentiality, a range is provided.

The product is supplied in bulk (i.e. packaging is irrelevant) and does not contain any biogenic carbon.

Table 1: Product composition

Product component	Mass (kg)	Post-consumer recycled material, weight % of product	Biogenic material, weight % of product	Biogenic material, kg C / declared unit
Cement*	130 - 550	0%	0%	0
Fly ash †	0 - 100	0%	0%	0
Ground granulated blast furnace slag (GGBFS) †	0 - 100	0%	0%	0
Aggregates †	880 - 1 200	0%	0%	0
Manufactured sand †	0 - 200	0%	0%	0
Natural sand †	530 - 1 010	0%	0%	0
Admixtures #	1 - 8	0%	0%	0
Water	140 - 185	0%	0%	0
Total	**2 357 kg/m^3**	**0%**	**0%**	**0**

** Mawsons uses cement in their mixes. 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 are below the mass cut-off, they have been considered in this LCA as they may exceed the environmental cut-off.

In this EPD, 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[2] regulation in concentrations >0.1% (m/m) (ECHA 2026). 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.

Product identification

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

[2] 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.

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LCA information

Declared unit

1 cubic metre (m^3) of Premixed concrete, as ordered by our clients.

Scope of the Environmental Product Declaration

This EPD covers the cradle-to-gate plus end-of-life life cycle stages (modules A1-A3, C1-C4, D).

Construction and use stages have not been included as we cannot define a typical scenario for the range of Premixed concrete products. These impacts are best determined at project level.

The modules declared, geographical scope, share of specific data (in GWP-GHG indicator) and data variation are shown in Table 2.

Table 2: Scope of the 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	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	AU	AU	AU	-	-	-	-	-	-	-	-	-	AU	AU	AU	AU	AU
Share of primary data	81%*																
Variation products	n/a (0%)																
Variation sites	<5%																

X = 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 we cannot define a typical scenario.
* The share of primary data is high as we used an EPD from our cement supplier, which is estimated to be made up of 95% primary data.

Life Cycle stages

Product stages (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, manufactured sand and natural sand are extracted from quarries.
- Supplementary Cementitious Materials (SCM): Fly ash and GGBFS (ground granulated blast furnace slag) are rest products from electricity generation, steel production, and (ferro)silicon 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 plants via (articulated) trucks. Transport of raw materials has been included in the LCA based upon actual transport modes and distances relevant to the site.

Manufacturing (Module A3)

Premixed 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 concrete products 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 (Modules C1-C4)

The end-of-life modules for Premixed concrete products 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. 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.

We have used the end-of-life scenario representative for Australian average building & demolition materials products based on the National Waste Report 2022 (NWR 2022). This scenario implies that 80% of the concrete is recycled and the remaining 20% of the concrete is sent to landfill. Concrete collected for recycling 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.

The end-of-life results are based on the above scenario for concrete with a density of 2 357 kg/m^3.

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

Table 3: End-of-life scenario parameters

Processes	Quantity per m^3 of concrete	Unit
Collection process specified by type	2 357 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 1 885 0	kg for re-use kg for recycling kg for energy recovery
Disposal to landfill	471	kg product or material for final deposition
Assumptions for scenario development	144 MJ of diesel for the demolition process (C1) 72 MJ of diesel for the crushing process (C3) + 7.5 MJ of electricity for the crushing process (C3)	

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. The PCR indicates that any production waste that is collected for recycling and reaches the end-of-waste state in module A3 can also be credited in module D. Nonetheless, production waste has not been considered in the net flow calculations for module D as a conservative approach.

Per cubic metre of concrete, module D credits the avoided impacts for 1 885 kg of crushed aggregates.

The net flow calculation is not affected by Supplementary Cementitious Materials (GGBFS, fly ash).

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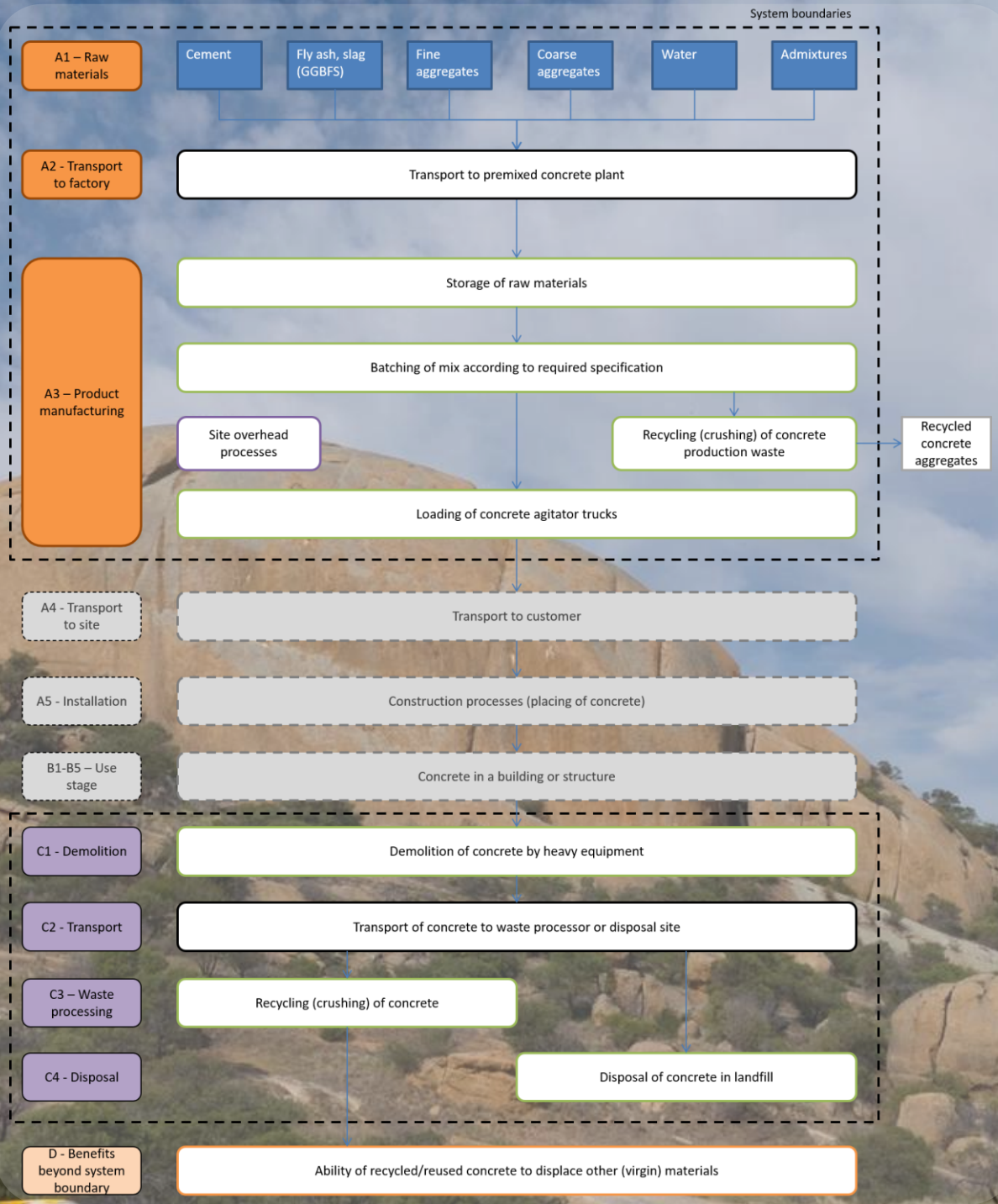
Figure 1: System boundary diagram of premixed concrete products



Background Data

Primary data covers the 2024 financial year (1 July 2023 – 30 June 2024) and has been sourced from Mawsons. Background data is predominantly sourced from EPDs, AusLCI and the AusLCI shadow database. Data for cement and GGBFS has been sourced from our suppliers' EPDs (Adbri 2023 and ICL 2023 respectively). 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.

Key assumptions

- The concrete composition of each product is provided by Mawsons and has been accepted as is.
- Cement and GGBFS data are taken from supplier-specific EPDs. This is expected to greatly improve the accuracy of Mawsons' EPD results.
- Parameters RSF, NRSF, CRU, MFR, MER and EE relate to foreground data only.
- 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.
- The end-of-life scenario is based on average landfill and recycling rates for building and demolition materials in Australia, as per the National Waste Report 2022 (NWR 2022), table 37.

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.

Electricity

Electricity has been modelled for core processes (concrete production and Mawson quarries) 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 2025 data (Table O.3). The GWP-GHG of the electricity is 1.00 kg CO_2e / kWh. The proxy residual grid mix is made up of brown coal (94.2%), natural gas (5.1%), and oil products (0.8%). 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.

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: As around half of all the fly ash generated in Australia is not used but stored in ponds, economic allocation was applied with zero value assigned to the fly ash. All environmental impacts of the power plant have been allocated to the main product: electricity. Fly ash has only received burdens of transport to our site.
- Blast Furnace Slag (BFS): BFS is a by-product from steelmaking. Our supplier's EPD applied economic allocation.
- Aggregates: Coarse aggregates and manufactured sand are produced through crushing of rock, which is graded in different sizes. The energy required for the crushing and screening does not differentiate from products. Therefore, impacts are allocated to products, based on the mass. In effect, coarse aggregates and manufactured sand have the same environmental profile.

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

Data Quality Assessment

Table 4: Data quality assessment

Process	Source type	Source	Reference year	Data category	Share of primary data, of GWP-GHG results for A1-A3
Manufacturing of concrete	Collected data	EPD owner	2024	Primary data	0%
Generation of electricity used in manufacturing of concrete	Collected data / Database	AusLCI	2024, 2023	Primary data	1%
Transport of raw materials to manufacturing site	Collected data / Database	AusLCI	2023	Primary data	10-15%
Production of cement	EPD	Supplier**	2023	Primary data, secondary data	60-70%
Production of GGBFS	EPD	Supplier	2023	Primary data, secondary data	3%
Production of aggregates by Mawsons	Collected data	EPD owner	2024	Primary data	0%
Production of aggregates by third party suppliers	Database	AusLCI	2023	Secondary data	0%
Production of admixtures	EPD	EFCA EPDs	2021, 2023	Secondary data	0%
Other processes	Databases	AusLCI, ecoinvent v3.10	2023, 2024	Secondary data	0%
Total share of primary data*, of GWP-GHG results for A1-A3					**81%**

** The share of primary data is calculated based on GWP-GHG results. It is a simplified indicator for data quality that supports the use of more primary data, to increase the representativeness of and comparability between EPDs. Note that the indicator does not capture all relevant aspects of data quality and is not comparable across product categories. The reported share of primary data is associated with uncertainty, as an EPD used as data source lacks information on the share of primary data.*

*** The reported share of primary data is associated with uncertainty, as an EPD used as data source lacks information on the share of primary data*

The EPD covers ready mixed concrete produced by Mawsons in Cluster 1 (Echuca, Moama Country Concrete, Rochester, Tongala) of Victoria which provided energy and waste data for the June 2023-May 2024 period. The mix designs, raw materials, and supply chain details are current (2026). The ingredients are mixed in a batching plant and sent to the customer as wet concrete. The EPD covers end-of-life in Australia, based on a generic scenario (see Table 3). Background data was sourced from EPDs and the AusLCI v1.42 database. Data quality was assessed according to EN 15804:2012+A2:2019, Annex E (Table E.1 - UN Environment Global Guidance on LCA database development). The use of very poor and poor data is disclosed in Table 5, together with fair data with more than 30% of impact on any core indicator.

Table 5: Data quality information

Data set	Criteria	Data quality level	Reason for level	Reason for using	Relevance
Production of admixtures	Geographical Technical	Fair Very poor	Proxy or Generic background data	Best available data	<10% for resource depletion (fossil fuels) <6% in all other core impact indicators

Environmental 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 6: 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[1]	ADP minerals & metals	kg Sb equivalent
Abiotic depletion potential – fossil fuels[1]	ADP fossil	MJ, net calorific value
Water use[1]	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[2]	IRP	kBq U235 equivalent
Ecotoxicity (freshwater)[1]	ETP-fw	CTUe
Human toxicity, cancer effects[1]	HTP-c	CTUh
Human toxicity, non-cancer effects[1]	HTP-nc	CTUh
Land use related impacts / soil quality[1]	SQP	- (dimensionless)
Additional GHG indicator	**Acronym**	**Unit**
Carbon footprint in line with IPCC AR5[3]	**GWP-GHG (IPCC AR5)**	**kg CO_2 eq**

[1] 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.

[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 some construction materials, is also not measured by this 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 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 IPCC AR 5 (IPCC 2013) indicator is determined using the IPCC AR5 Global Warming Potentials (GWP) with a 100-year time horizon. This indicator is aligned with Australia's greenhouse gas reporting frameworks.

Table 7: 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 8: 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}

VARIATION (A1-A3) PER IMPACT CATEGORY

The results of the LCA are based on data for a single product manufactured at multiple plants in Cluster 1 (Echuca, Moama Country Concrete, Rochester, Tongala). The variation in GWP-GHG results between the plants is <5%.

Environmental performance

The following section presents the results for each Life Cycle Assessment module. The results have been calculated with SimaPro software v9.6.0.1, using characterisation factors based on the “EF 3.1 package” for characterisation factors to be used in the EU’s Product Environmental Footprint (PEF) framework.

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.

Water flows have been disaggregated using the 36 ALCAS water catchments for which characterisation factors are available for both Pfister WSI and the AWARE method.

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 results of the end-of-life stage (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3)”.

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

Table 9: Environmental indicators EN 15804+A2, N2020STD, 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.	1.63E+02	1.20E+01	1.51E+01	7.74E+00	1.12E+00	-1.54E+01
GWP-fossil	kg CO_2 eq.	1.63E+02	1.20E+01	1.51E+01	7.74E+00	1.12E+00	-1.54E+01
GWP-biogenic	kg CO_2 eq.	1.75E-01	8.28E-04	9.32E-04	7.37E-03	9.02E-05	-6.20E-03
GWP-luluc	kg CO_2 eq.	9.42E-03	5.98E-06	7.12E-06	3.59E-06	5.42E-07	-8.36E-06
ODP	kg CFC11 eq.	1.36E-05	2.00E-06	2.38E-06	9.77E-07	1.83E-07	-2.05E-06
AP	mol H+ eq.	1.53E+00	1.37E-01	1.33E-01	2.13E-02	2.67E-03	-1.54E-01
EP-freshwater	kg P eq.	3.09E-03	1.66E-06	9.07E-07	5.74E-06	1.52E-07	-9.36E-06
EP-marine	kg N eq.	5.51E-01	5.97E-02	4.17E-02	3.79E-03	4.81E-04	-6.13E-02
EP-terrestrial	mol N eq.	6.13E+00	6.55E-01	4.57E-01	4.13E-02	5.26E-03	-6.83E-01
POCP	kg NMVOC eq.	1.57E+00	1.75E-01	1.11E-01	1.11E-02	1.41E-03	-1.79E-01
ADP minerals & metals[1]	kg Sb eq.	3.34E-04	1.47E-08	1.75E-08	1.92E-06	1.31E-09	-5.99E-07
ADP fossil[1]	MJ (NCV)	1.94E+03	1.74E+02	2.07E+02	1.10E+02	1.59E+01	-2.04E+02
WDP[1]	m^3 world eq. deprived	9.19E+02	1.10E+00	1.31E+00	1.13E+00	1.00E-01	-1.80E+00
Additional indicators							
GWP-GHG	kg CO_2 eq.	1.60E+02	1.20E+01	1.51E+01	7.74E+00	1.12E+00	-1.54E+01
PM	Disease incidence	8.75E-06	3.63E-06	7.46E-07	1.42E-07	1.41E-08	-3.73E-06
IRP[2]	kBq U235 eq.	6.66E-02	2.55E-04	3.02E-04	1.56E-03	2.31E-05	-3.69E-04
ETP-fw[1]	CTUe	9.60E+02	3.86E+01	4.58E+01	1.90E+01	3.47E+00	-4.05E+01
HTP-c[1]	CTUh	3.43E-08	4.83E-10	6.47E-11	1.62E-10	8.83E-12	-5.34E-10
HTP-nc[1]	CTUh	1.63E-06	2.57E-09	1.23E-09	1.06E-09	1.07E-10	-3.87E-09
SQP[1]	-	1.20E+03	8.36E-01	9.30E-01	2.61E+01	2.63E+01	-9.60E+02
Carbon footprint							
GWP-GHG (IPCC AR5)	**kg CO_2 eq**	160	12.0	15.1	7.74	1.12	-15.4

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

Table 10: EN 15804+A2 parameters, N2020STD, per m^3

Parameter	Unit	Module A1-A3	Module C1	Module C2	Module C3	Module C4	Module D
PERE	MJ_{NCV}	3.70E+01	2.70E-01	2.97E-01	1.91E+00	3.11E-02	-6.53E-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}	3.70E+01	2.70E-01	2.97E-01	1.91E+00	3.11E-02	-6.53E-01
PENRE	MJ_{NCV}	1.98E+03	1.74E+02	2.07E+02	1.10E+02	1.59E+01	-2.04E+02
PENRM	MJ_{NCV}	8.42E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ_{NCV}	1.99E+03	1.74E+02	2.07E+02	1.10E+02	1.59E+01	-2.04E+02
SM	kg	6.94E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ_{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	2.07E+00	2.52E-02	3.00E-02	3.93E-02	2.30E-03	-5.53E-01
HWD	kg	8.11E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NHWD	kg	2.30E+00	7.98E-04	8.79E-04	5.39E-03	4.71E+02	-1.21E-02
RWD	kg	8.79E-04	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	1.25E+02	0.00E+00	0.00E+00	1.89E+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 11: EN 15804+A1 indicators*, N2020STD, per m^3

Environmental Indicator	Unit	Module A1-A3	Module C1	Module C2	Module C3	Module C4	Module D
GWP	kg CO_2 eq	1.64E+02	1.20E+01	1.51E+01	7.72E+00	1.11E+00	-1.55E+01
ODP	kg CFC11 eq	4.97E-06	1.58E-06	1.88E-06	7.72E-07	1.44E-07	-1.62E-06
AP	kg SO_2 eq	5.34E-01	9.75E-02	7.34E-02	1.35E-02	2.15E-03	-1.03E-01
EP	kg PO_4^{3-} eq	1.02E-01	2.01E-02	1.41E-02	1.32E-03	1.65E-04	-2.23E-02
POCP	kg C_2H_4 eq	2.03E-02	9.56E-03	4.74E-03	7.51E-04	1.07E-04	-9.56E-03
ADPE	kg Sb eq	2.19E-05	1.49E-08	1.77E-08	1.92E-06	1.34E-09	-6.00E-07
ADPF	MJ_{NCV}	1.45E+03	1.74E+02	2.07E+02	1.10E+02	1.59E+01	-2.04E+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

Additional scenarios

Table 12: Environmental indicators EN 15804+A2, 100% end-of-life scenarios, N2020STD per m³

Environmental Indicator	Unit	Module C3	Module C4	Module D	Module C3	Module C4	Module D
Core Indicators			**100% recycling**			**100% landfill**	
GWP-total	kg CO_2-eq.	1.01E+01	0	-1.93E+01	0	5.59E+00	0
GWP-fossil	kg CO_2-eq.	1.01E+01	0	-1.93E+01	0	5.59E+00	0
GWP-biogenic	kg CO_2-eq.	9.23E-03	0	-7.75E-03	0	4.51E-04	0
GWP-luluc	kg CO_2-eq.	4.57E-06	0	-1.05E-05	0	2.71E-06	0
ODP	kg CFC11-eq.	1.25E-06	0	-2.56E-06	0	9.13E-07	0
AP	mol H+ eq.	9.41E-02	0	-1.92E-01	0	1.33E-02	0
EP-freshwater	kg P eq.	7.18E-06	0	-1.17E-05	0	7.62E-07	0
EP-marine	kg N eq.	3.86E-02	0	-7.66E-02	0	2.40E-03	0
EP-terrestrial	mol N eq.	4.23E-01	0	-8.53E-01	0	2.63E-02	0
POCP	kg NMVOC eq.	1.13E-01	0	-2.23E-01	0	7.06E-03	0
ADP minerals & metals[1]	kg Sb eq.	2.40E-06	0	-7.49E-07	0	6.56E-09	0
ADP fossil[1]	MJ (NCV)	1.41E+02	0	-2.55E+02	0	7.95E+01	0
WDP[1]	m³ world eq. deprived	1.43E+00	0	-2.25E+00	0	5.02E-01	0
Additional indicators			**100% recycling**			**100% landfill**	
GWP-GHG	kg CO_2-eq.	1.01E+01	0	-1.93E+01	0	5.59E+00	0
PM	Disease incidence	2.34E-06	0	-4.66E-06	0	7.06E-08	0
IRP[2]	kBq U235 eq.	1.95E-03	0	-4.61E-04	0	1.16E-04	0
ETP-fw[1]	CTUe	2.45E+01	0	-5.06E+01	0	1.73E+01	0
HTP-c[1]	CTUh	4.45E-10	0	-6.68E-10	0	4.42E-11	0
HTP-nc[1]	CTUh	2.29E-09	0	-4.84E-09	0	5.34E-10	0
SQP[1]	-	3.26E+01	0	-1.20E+03	0	1.31E+02	0
Carbon footprint			**100% recycling**			**100% landfill**	
GWP-GHG (IPCC AR5)	**kg CO_2 eq**	**10.1**	**0**	**-19.3**	**0**	**5.59**	**0**

Footnotes:

[1] 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.

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

Table 13: EN 15804+A2 parameters, 100% end-of-life scenarios, N2020STD per m^3

Parameter	Unit	Module C3	Module C4	Module D	Module C3	Module C4	Module D
		100% recycling			100% landfill		
PERE	MJ_{NCV}	2.39E+00	0	-8.16E-01	0	1.56E-01	0
PERM	MJ_{NCV}	0.00E+00	0	0.00E+00	0	0.00E+00	0
PERT	MJ_{NCV}	2.39E+00	0	-8.16E-01	0	1.56E-01	0
PENRE	MJ_{NCV}	1.41E+02	0	-2.55E+02	0	7.95E+01	0
PENRM	MJ_{NCV}	0.00E+00	0	0.00E+00	0	0.00E+00	0
PENRT	MJ_{NCV}	1.41E+02	0	-2.55E+02	0	7.95E+01	0
SM	kg	0.00E+00	0	0.00E+00	0	0.00E+00	0
RSF	MJ_{NCV}	0.00E+00	0	0.00E+00	0	0.00E+00	0
NRSF	MJ_{NCV}	0.00E+00	0	0.00E+00	0	0.00E+00	0
FW	m^3	4.95E-02	0	-6.87E-01	0	1.15E-02	0
HWD	kg	0.00E+00	0	0.00E+00	0	0.00E+00	0
NHWD	kg	6.75E-03	0	-1.52E-02	0	2.36E+03	0
RWD	kg	0.00E+00	0	0.00E+00	0	0.00E+00	0
CRU	kg	0.00E+00	0	0.00E+00	0	0.00E+00	0
MFR	kg	2.36E+03	0	0.00E+00	0	0.00E+00	0
MER	kg	0.00E+00	0	0.00E+00	0	0.00E+00	0
EE	MJ	0.00E+00	0	0.00E+00	0	0.00E+00	0

Abbreviations

Abbreviation	Definition
AusLCI	Australian Life Cycle Inventory (database)
BFS / GGBFS	blast furnace slag / ground granulated blast furnace slag
CEN	European Committee for Standardization
CPC	Central Product Classification
EF	Environmental Footprint
EFCA	European Federation of Concrete Admixtures Associations
EN	European Norm (Standard)
EPD	Environmental Product Declaration
GPI	General Programme Instructions
ISO	International Organization for Standardization
kg	kilogram
km	kilometre
kWh	kilo Watt hour
LCA	Life Cycle Assessment
m^3	cubic metre
NATA	National Association of Testing Authorities, Australia
ND	Not Declared
NWR	National Waste Report
PEF	Product Environmental Footprint
PCR / c-PCR	Product Category Rules / complimentary Product Category Rules
SCM	Supplementary Cementitious Materials
SVHC	Substances of Very High Concern
t	tonne
UN	United Nations

Version history

Version	Notes
1	Original version of the EPD, published 2026-07-31

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