SOFTPILE 20MPa

Generic EPD - Perth Region

WESTERN AUSTRALIA - PERTH

Environmental Product Declaration

In Accordance with Environdec c-PCR-003 Concrete, concrete elements (EN 16757:2023), ISO 14025 and EN15804:A2

Programme Operator: EPD International AB

Regional Programme: EPD Australasia

An EPD should provide current information and 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.

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Heidelberg Materials

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Heidelberg Materials

Heidelberg Materials Australia

Who is Heidelberg Materials?

Heidelberg Materials is one of the world's largest building materials companies focused on producing materials to build our future.

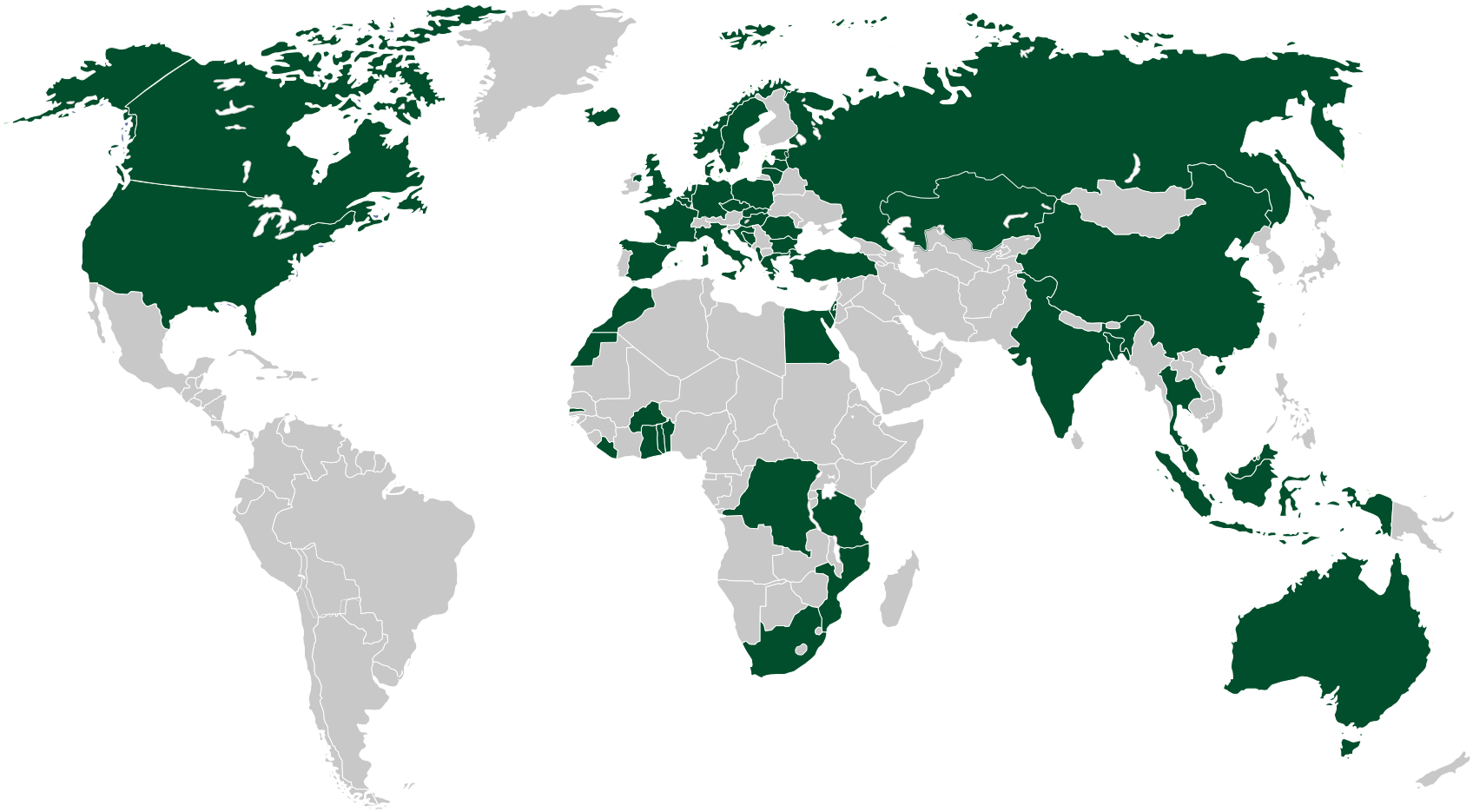
50 countries

51,000 employees

3,000 locations

Leading market positions in cement, aggregates and ready-mixed concrete.

Revenue in 2023 – 21.2 Billion Euro



Global expertise, Local experience

With more than 4,000 employees across 300 sites, we have an extensive production and logistics network across Australia.

We think global and act local - we benefit from global research and development enhanced by national collaboration to offer a comprehensive range of high-quality concrete, aggregates, road base, sand and asphalt products. We also produce a wide range of sustainable and recycled construction materials for civil construction and infrastructure projects.

We are driven by excellence and high performance and together we will shape Australia’s construction materials industry building a legacy for generations to come.

Our sustainability charter

The Heidelberg Materials Australia group of companies are leaders in the heavy construction materials industry. However, we never take it for granted. We help to build the infrastructure of communities by working with them and being a part of them. While we are known for our "we'll make it happen" attitude, we are conscious of our socio-economic and environmental impacts.

One of our strategic goals is to drive operational excellence and innovation, which means we are always looking for new ways of working to help preserve and protect our planet's natural resources.

Heidelberg Materials sustainability commitments 2030 serve as a guiding principle for our sustainability strategy.

The strategy is comprised of four strategic pillars and supports initiatives that focus on CO_2 Emissions, Sustainable Products, Biodiversity, Water and Corporate Social Responsibility.

To realise these sustainability goals, individual plans will be developed for our operations, addressing their unique sustainability challenges. We will also build sustainability targets into everyone's roles, recruit sustainability champions and invest in resources and projects that support our sustainability plans. Our plans and commitments align directly with each of our core values: Care, Collaboration and Ownership.

Committing to these goals as a team is an important part of being a truly sustainable business.

I look forward to working together to realise better outcomes for our people, our communities and our planet.

Phil Schacht
Chief Executive
Heidelberg Materials Australia

"Driven by excellence and high performance, together we will shape Australia's construction materials industry, building a legacy for generations to come"

Life Cycle and Process

Product EPD Process

Declared Unit is 1m³ of Concrete

- The process is used to produce an accurate estimation at all stages of the product life cycle from cradle to grave. Estimation at each stage is based on actual data which is a combination of both current and prior year average consumption per declared unit.

Life Cycle Assessment Tool

- For the purposes of creating this Environmental Product Declaration (EPD), the Global Cement & Concrete Association (GCCA) concrete EPD tool v. 5.0 (short: GCCA tool) has been employed.

EPDs are created under either of 2 streams:

- Generic Stream - The class of product modelled is used for a particular geographical region using averaged data across operations.
- Project-specific stream – Models the manufacture of specific products required for a particular project being delivered from specific plant(s) using weighted average data where relevant and possible. Reports created after the completion of a project offer the highest accuracy, including all mix variations for each delivery.

The main data categories include:

- The average bill of materials (BOM) for the concrete mix selected in the range of concrete plants specified including their average raw material travel distance, or the calculated BOM based on actual delivered materials incl. travel distances (average or specific) for the producing plants.
- The average fuel, water and energy consumption per declared unit between those plants;
- Plant production waste based on a nationally calculated figure;
- Recarbonation of concrete is determined through pre-defined values within GCCA tool for the type of construction project (- kg CO_2 eq./ m³ at Stage B, -1.866477801 kg CO_2 eq./ m³ at Stage C3, and - kg CO_2 eq./ m³ at Stage C4, 5.309574187 where known; and,
- End of life recycling is based upon industry data. 3.898979692

- This EPD Process is certified using GCCA international modelling of energy use and environmental impact to obtain a suitable estimation for products manufactured.
- Pre-defined cement and clinker data provided by the GCCA tool are used only where no better (supplier/source specific) information is available.

Assumptions & Limitations

- This is a generic EPD.
- All modelling assumptions adopted from the GCCA Tool.
- The geographical scope involves WESTERN AUSTRALIA - PERTH.
- Raw material (inbound) transport distances is the previous year's travel distance average weighted according to deliveries across operations.
- For generic EPDs travel for diesel truck from concrete production site to customer site was set to 20 km default. Longer or shorter travel distances will have minor effects on the overall CO_2 values. Concrete plants in the study include: Canning Vale, Byford, Gbangara, Mandurah, East Perth, and Rockingham, Truck type of >32 tonne was assumed to be fully utilized travelling to construction site with empty returns.
- Travel distance for fuel from depots to operations was set to 41 km.
- Concrete mixes are assumed to use an equal amount of site fuel and energy and responsible for an equal amount of waste flows.
- Production is assumed to be equal across all plants included in the study for the calculation of the bill of materials.
- Water usage in operations is averaged over the entire state.
- Grid purchased electricity mixes is based on the specific state's energy mix from OpenNEM. For this project, energy mix was sourced from coal and peat (29%), gas (32%), solar (21%), wind (17%), hydro (0%), and biomass (0.3%). The electricity emission (GWP-GHG) is 0.56 kg CO2e/kWh.
- Travel for materials sources internationally included from shipping origin.
- Reference Service Life (RSL) is set to 50 years as per default. It's based on the lowest exposure class A1 & A2 (AS 3600:2018 "Concrete Structures") in relatively benign environments.

Product EPD Process

Bill of Materials	Low Level [%]	High Level [%]
Cement	2	17
Supplementary Cementitious Materials	<1	14
Aggregates	63	92
Water	2	13
Admixtures	0	<1
Reinforcements	0	<1

The materials (by mass%) contained in Generic EPD - Perth Region mixes are summarized in the table above.

Hazard information related to concrete placement

GHS classifications

- Skin Corrosion Category 1
- Serious Eye Damage –Category 1
- Skin Sensitisation Category 1
- Specific Target Organ Toxicity (Repeated Exposure) Category 2

Hazard Statement(s)

- H302 –Harmful if swallowed
- P280 –Wear protective gloves/clothing/eye protection.
- H314 –Causes severe skin burns and eye damage
- H317 –May cause an allergic skin reaction
- H318 – Causes serious eye damage
- H373 –May cause damage to lungs by inhalation (dust from dried product)

By-Products, Recycled Materials & Allocations

Co-products would be allocated via economic allocations and then normalized based on BOM. The following materials are the product of waste streams of other industrial processes:

Fly ash

- A by-product of coal-fired power stations, fly ash is considered to carry no environmental impact for the purposes of this EPD, hence an economic allocation of $0 has been applied to fly ash. The only burdens are of transport to manufacturing sites.

Ground Granulated Blast Furnace Slag (GGBFS)

- Blast furnace slag is a by-product of steel production that is dried and ground for use in concrete production. To duly allocate the environmental impacts, economic allocation has been employed.

Silica fume

- As a by-product of silicon production, silica fume is considered to carry no environmental burden for the purposes of this EPD.

Recycled concrete aggregate

- A component of the boarder category of construction and demolition waste, environmental impacts are allocated on the basis of reprocessing the material following delivery to the recycling facility.

Manufactured Sand

- A by-product of processing coarse aggregate. This manufactured sand is a direct replacement for natural sand and prevents the need to extract natural resources.

Packaging

- This concrete is not produced with any packaging, instead delivered directly to site immediately following production.

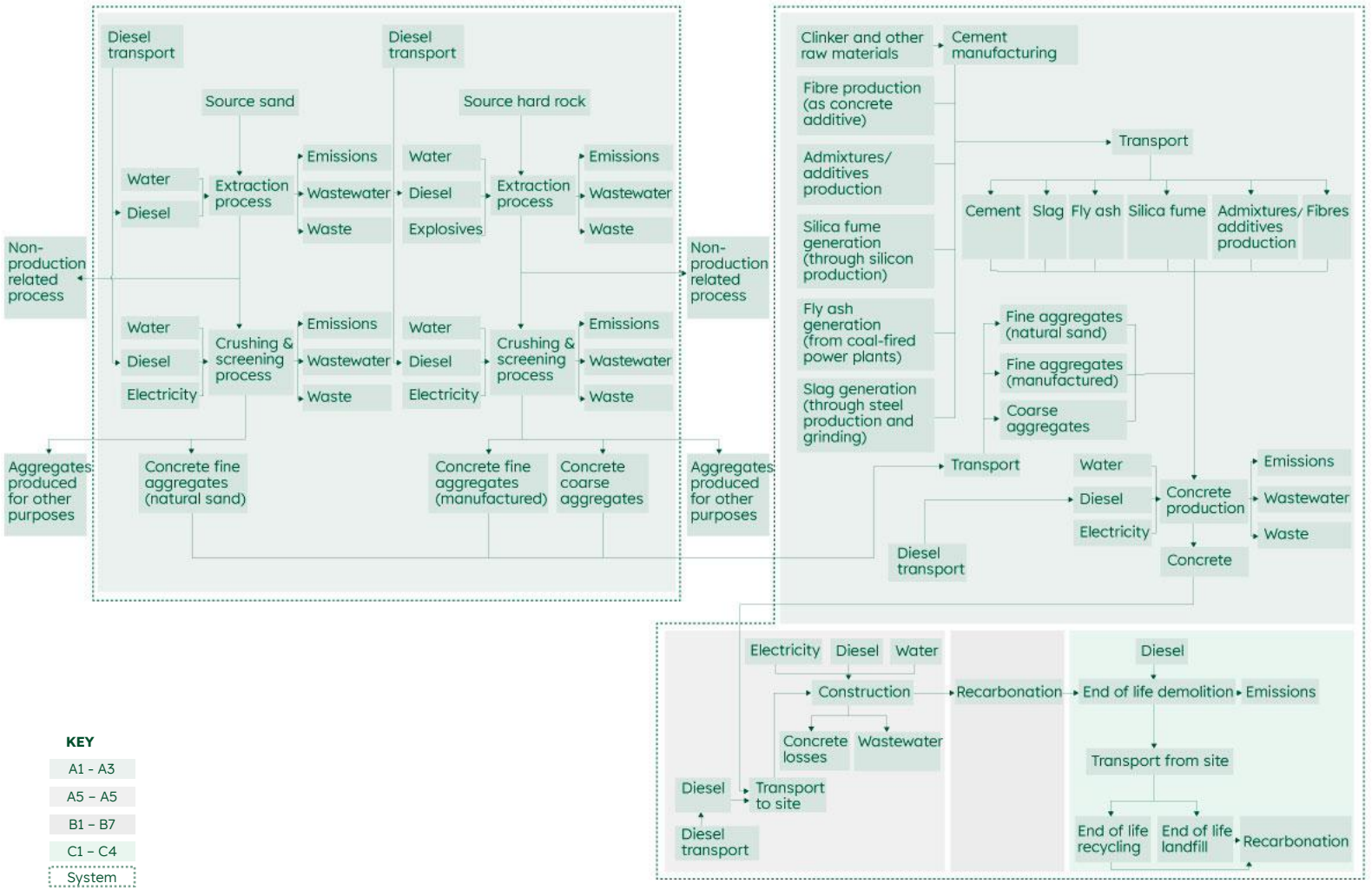
In Accordance with Environdec c-PCR-003 Concrete, concrete elements (EN 16757), ISO 14025 and EN15804:A2

Product Lifecycle Stages

	Product Stage			Construction Stage		Use Stage							End of Life Stage				Benefits & loads for the next product system
	Raw Material Supply	Transport	Manufacturing	Transport	Construction/installation process	Use	Maintenance incl. transport	Repair incl. transport	Replacement incl. transport	Refurbishment incl. transport	Operational Energy Use	Operational Water Use	De-construction & demolition	Transport	Re-use recycling	Final Disposal	Reuse, Recovery Recycling
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Geography	GLO	GLO	AU	AU	AU	AU	AU	AU	AU	AU	AU	AU	AU	AU	AU	AU	AU
Specific data	>90%																
Variation products	<10%																
Variation sites	<10%																

- All stages of the product lifecycle have been considered for this EPD – cradle to grave. By its nature, there are some stages of the lifecycle that are not applicable to the concrete product.
- The scenario applied for the use stage assumes that under normal use, no maintenance repair or replacement of the product during its service life is required. As a result, the values are displayed as zero.
- Those stages that, due to practicality, cannot be assessed accurately draw on default values of the underlying GCCA tool.
- For Project-specific EPDs, allocation is determined by the supplying plants with estimates as to the likely volume to be delivered from each. Where existing and sufficient data exists, historical data will be used to make this determination.

Product Lifecycle Stages



- The lifecycle model and system boundary is the same for both Generic and Project-specific concrete EPDs, as detailed in the graphic.
- All stages of the lifecycle, from quarry to recycling are covered by the EPD.

Cut-off rules

The cut-off threshold for the LCA study was flows contributing less than 1% for any individual input included in the LCA. No flows were deliberately excluded due to this threshold, however particularly minor impacts (e. g. packaging of chemical admixtures) were not considered. Cut off will occur only when data, or reliable estimates, are not practical to source. The contribution of capital goods (production equipment and infrastructure) and personnel are non-attributable and excluded for the system boundary.

Product Data Sources

LCA Stage	Item	Source	Timing	Data Source	Data Quality		
					Geographical	Technical	Time
Product Description	Product description and density	ERP report Bill of Materials and material specific data	Upon EPD creation	Primary	Very good	Very good	Very good
A1-3 Materials	Raw Materials	ERP report BOM and Mix design compilation used in conjunction with material template Note. Upstream process for raw materials utilise data from ecoinvent 3.10. Specific cement EPD data by the cement manufacturer was used if available. Published cement EPDs were used to create concrete EPDs. In the rare case that specific cement data was not possible, region-specific default cement and clinker values (default values provided by the GCCA tool) would have been used. This would be reflected in "Specific data."	Upon EPD creation	Secondary	Very good	Good	Very good
A1-3 Materials	Inbound travel (raw materials)	ERP report 2. Inbound Travel drawing from actual deliveries from sources to operations. Where delivery data not available, travel calculated based on Google Maps. Train travel (only for operations around Melbourne) calculated by actual Google Maps distance.	Full prior year data, average per delivery Actual travel distances between source and operation.	Primary	Very good	Good	Very good
A1-3 Materials	Allocation Factor (for secondary co products):	Slag: AusLCI Fly Ash & Silica fume: no allocation as they are industrial by-products.	Upon EPD creation	Secondary	Very good	Good	Very good
1-3 Manufacturing	Plant Energy and Fuel Consumption	ERP Report 3. Concrete Energy Use, drawing on actual invoiced usage.	Full prior year data, average per cubic metre	Primary	Very good	Very good	Very good
A1-3 Manufacturing	Electricity Energy Sources	Sourced from OpenNEM https://opennem.org.au; Australian Energy Market Operator. Excludes imports.	Full year prior data, state-based, percentages	Secondary	Very good	Very good	Very good
A1-3 Waste Management	Waste and wastewater	Wastewater volume set to 9L per 1 m^3	Static	Secondary	Very good	Good	Very good
A4-5 Construction	Outbound Travel	For generic EPDs: ERP report 5. Outbound travel drawing from actual deliveries from operations to customer sites. Where data not available, travel calculated based on Google Maps. For project-specific EPDs: The project-specific travel distances from the main plant to the construction site was applied. For both scenarios, diesel truck is used to transport deliveries to customer site/s. A5 uses default GCCA Tool settings for: 2.8 kWh electricity, 1.7 L diesel in building machine, 669 kg water, and 0.7 m^3 wastewater. Note that internal concrete losses are at ~1% (based on internal reports)	Generic EPD: Full prior year data, average per delivery. Project-specific EPD: Actual travel distances between plant and construction site.	Primary	Very good	Good	Very good
B. Use	Re-carbonation	Default GCCA Tool settings	NA	Proxy	Good	Good	Very good

Product Data Sources

LCA Stage	Item	Source	Timing	Data Source	Data Quality		
					Geographical	Technical	Time
C. End of Life Demolition	Demolition	Default GCCA Tool settings (2.674 L diesel in building machine, 0.0365 mg PM2.5, 0.184 mg PM10, 0.139 mg PM>10). PM refers to particulate matter.	NA	Proxy	Good	Good	Very good
C. End of Life Transport	Transport	Default GCCA Tool settings	NA	Proxy	Good	Good	Very good
C. End of Life Waste Processing	Recycling Rate at EOL	Masonry materials recycling rate obtained from annual National Waste Report published (e. g. for National Waste Report 2022, page 41, figure 29). Referenced recycling rate is used in industry as closest to concrete-specific value. National Waste Reports	Prior year National Waste Report if available. If not, then latest available	Proxy	Good	Good	Very good
C. End of Life Disposal	Disposal Rate at EOL	Disposal rate inverse of masonry materials recycling rate obtained from annual National Waste Report published National Waste Reports	Prior year National Waste Report if available. If not, then latest available	Proxy	Good	Good	Very good
D Benefits and Loads		Default GCCA Tool settings	NA	NA	NA	NA	NA
General	General	Ecoinvent database used by the GCCA tool Note: This covers environmental information for all raw materials and energy sources. Cement, where data is available, employs specific raw material and energy data for the product manufacture and for each component draws on Eco Invent Data.	NA	Secondary	Very good	Good	Very good

Product environmental performance

Heidelberg Materials

Product Environmental Performance

Comment	All information about goal and scope necessary for results interpretation are present in the latest version of the “LCA Model” report, available in GCCA’s Industry EPD Tool. Declared GWP-GHG results for modules A1-A3 are <10%. 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. Since Module C is included in the EPD, the use of Module A1-A3 results without considering the results of Module C is discouraged. EF3.0 based EN15804+A2 impact assessment methodology has been is used for the GWP indicators. The removals and emissions associated with biogenic carbon content of i) the product and ii) the packaging are not significant or even not relevant in the sector. The only limitation is the uptake of CO_2 in A1-A3 (e.g. biobased insulation materials in precast elements or biobased packaging materials) and reemission in A5 (packaging end-of-life) or C3-C4 (product end-of-life). This does not affect the GWP-tot indicator. The tool does not calculate the ‘Radioactive waste disposed’ indicator, it is considered not to be significant for the sector.
Core Environmental Impact Indicators	**GWP-GHG** (Global Warming Potential, GHG) • **GWP-tot** (Global Warming Potential total) • **GWP-fos** (Global Warming Potential fossil fuels) • **GWP-bio** (Global Warming Potential biogenic) • **GWP-luc** (Global Warming Potential land use and land use change) • **ODP** (Depletion potential of the stratospheric ozone layer) • **AP** (Acidification potential, Accumulated Exceedance) • **EP-fw** (Eutrophication potential, freshwater) • **EP-mar** (Eutrophication potential, fraction of nutrients reaching marine end compartment) • **EP-ter** (Eutrophication potential, Accumulated Exceedance) • **POCP** (Formation potential of tropospheric ozone) • **ADPE**[1] (Abiotic depletion potential for non- fossil resources) • **ADPF**[1] (Abiotic depletion for fossil resources potential) • **WDP**[1] (Water (user) deprivation potential, deprivation-weighted water consumption)

[1] *The results of this environmental impact indicator shall be used with care as the uncertainties of the results are high and as there is limited experience with the indicator.*

Product Environmental Performance

Additional Environmental Impact Indicators	**PM** (Potential incidence of disease due to PM emissions) • **IRP**[2] (Potential Human exposure efficiency relative to U235) • **ETP**[1] (Potential Comparative Toxic Unit for ecosystems) • **HTPC**[1] (Potential Comparative Toxic Unit for humans - cancer) • **HTPNC**[1] (Potential Comparative Toxic Unit for humans - non-cancer) • **SQP**[1] (Potential soil quality index)
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 materials) • **RSF** (Use of renewable secondary fuels) • **NRSF** (Use of non-renewable secondary fuels) • **NFW** (Net use of fresh water)
Waste Categories	**HWD** (Hazardous waste disposed) • **NHWD** (Non-hazardous waste disposed) • **RWD** (Radioactive waste disposed)
Output Flows	**CRU** (Components for re-use) • **MFR** (Materials for recycling) • **MER** (Materials for energy recovery) • **EE** (Exported energy)
Extra Indicators	**CC**[1] (Emissions from calcination and removals from carbonation) • **CWRS** (Emissions from combustion of waste from renewable sources used in production processes) • **CWNRS** (Emissions from combustion of waste from non-renewable sources used in production processes) • **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)

[1] The results of this environmental impact indicator shall be used with care as the uncertainties of the results are high and 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 from some construction materials is also not measured by this indicator.

Product Environmental Performance

Product identification	**SOFTPILE 20MPa**
EPD Registration Number	**EPD-IES-0018963:001**
Production site(s)	**Perth**
Compressive strength	**20**
Density	**2177.6 kg/m³**
Reference service life	**50 Years**
Recycling Rate At EoL	**81%**
Declared unit	**1 m³**
Scope	**A1-A3 + A4-A5 + B1-B7 + C1-C4 + D, cradle-to-grave**
Methodology	**GCCA's Industry EPD Tool for Cement and Concrete (V5.0), International version**
Reference Year	**2024**

Product Environmental Performance

EPD Registration Number EPD-IES-0018963:001

Core environmental impact indicators

		A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG	kg CO_2 eq.	2.35E+02	4.14E+00	1.15E+01	-5.31E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.64E+00	8.39E+00	2.95E+00	-3.90E+00	-1.13E+01
GWP-tot	kg CO_2 eq.	2.35E+02	4.14E+00	1.15E+01	-5.31E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.64E+00	8.39E+00	2.95E+00	-3.90E+00	-1.13E+01
GWP-fos	kg CO_2 eq.	2.33E+02	4.13E+00	1.15E+01	-5.31E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.63E+00	8.38E+00	2.94E+00	-3.90E+00	-1.13E+01
GWP-bio	kg CO_2 eq.	2.78E+00	1.70E-04	3.76E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.05E-03	1.80E-03	5.73E-03	0.00E+00	-2.82E-02
GWP-luc	kg CO_2 eq.	5.81E-02	1.68E-03	2.93E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.36E-04	4.03E-03	5.90E-03	0.00E+00	-8.94E-03
ODP	kg CFC 11 eq.	2.50E-06	6.45E-08	2.22E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.47E-07	1.21E-07	3.67E-08	0.00E+00	-9.22E-08
AP	mol H+ eq.	7.38E-01	1.72E-02	8.75E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.69E-02	4.37E-02	2.65E-02	0.00E+00	-7.15E-02
EP-fw	kg P eq.	8.89E-03	1.06E-04	5.32E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.17E-05	2.82E-04	6.51E-04	0.00E+00	-1.02E-03
EP-mar	kg N eq.	1.91E-01	6.27E-03	3.16E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.03E-02	1.63E-02	6.14E-03	0.00E+00	-1.70E-02
EP-ter	mol N eq.	2.15E+00	6.83E-02	3.39E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.41E-01	1.78E-01	6.38E-02	0.00E+00	-2.15E-01
POCP	kg NMVOC eq.	5.84E-01	2.50E-02	1.01E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.32E-01	5.96E-02	1.91E-02	0.00E+00	-5.82E-02
ADPE	kg Sb eq.	9.94E-05	1.16E-05	1.87E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.53E-06	2.30E-05	2.52E-05	0.00E+00	-6.00E-05
ADPF	MJ, net calorific value	1.32E+03	6.04E+01	1.30E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.26E+02	1.18E+02	6.21E+01	0.00E+00	-1.36E+02
WDP	m^3 world eq. deprived	3.89E+01	2.90E-01	1.09E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.09E-01	6.90E-01	9.88E-01	0.00E+00	-2.28E+01

Parameters describing resource use

		A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ, net calorific value	1.35E+01	7.93E-01	5.20E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.73E-01	2.31E+00	7.89E+00	0.00E+00	-1.12E+01
PERM	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ, net calorific value	1.35E+01	7.93E-01	5.20E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.73E-01	2.31E+00	7.89E+00	0.00E+00	-1.12E+01
PENRE	MJ, net calorific value	4.16E+02	6.04E+01	1.21E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.26E+02	1.18E+02	6.21E+01	0.00E+00	-1.36E+02
PENRM	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ, net calorific value	4.16E+02	6.04E+01	1.21E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.26E+02	1.18E+02	6.21E+01	0.00E+00	-1.36E+02
SM	kg	2.38E+02	0.00E+00	2.38E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ, net calorific value	2.15E+01	0.00E+00	2.15E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ, net calorific value	5.03E+01	0.00E+00	5.03E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NFW	m^3	2.11E+00	8.89E-03	3.54E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.19E-03	1.98E-02	2.82E-02	0.00E+00	-5.38E-01

Product Environmental Performance

EPD Registration Number EPD-IES-0018963:001

Additional environmental impact indicators

		A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PM	Disease incidence	6.99E-06	4.23E-07	1.72E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.47E-06	9.21E-07	3.08E-07	0.00E+00	-1.16E-06
IRP	kBq U235 eq.	9.23E-01	5.33E-02	1.94E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.65E-02	1.52E-01	5.92E-01	0.00E+00	-9.77E-01
ETP	CTUe	9.66E+02	1.45E+01	1.75E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.79E+01	3.41E+01	1.53E+01	0.00E+00	-7.25E+01
HTPC	CTUh	1.73E-07	2.07E-08	4.11E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.77E-08	5.38E-08	1.19E-08	0.00E+00	-1.34E-07
HTPNC	CTUh	1.17E-06	3.99E-08	6.73E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.72E-08	7.59E-08	4.33E-08	0.00E+00	-9.16E-08
SQP	dimensionless	9.78E+02	6.08E+01	3.12E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.86E+00	1.10E+02	3.38E+01	0.00E+00	-1.44E+02

Other environmental information describing waste categories

		A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NHWD	kg	3.30E-02	0.00E+00	6.06E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RWD	kg	1.72E-04	1.30E-05	4.58E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.38E-05	3.75E-05	1.45E-04	0.00E+00	-2.37E-04

Environmental information describing output flows

		A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	0.00E+00	0.00E+00	1.57E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.57E+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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Extra indicators

		A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
CC	kg CO_2 eq.	0.00E+00	0.00E+00	-1.11E-01	-5.31E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-1.87E+00	-3.90E+00	0.00E+00
CWRS	kg CO_2 eq.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CWNRS	kg CO_2 eq.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
GWP-prod	kg CO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
GWP-pack	kg CO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Product Environmental Performance

The EPD values presented are indicative of local material performance at the time of publishing and are subject to change based on material availability and seasonal factors.

Product Identification	EPD Registration Number	Compressive strength [MPa]	A1-A3 GWP-tot[1] [kg CO_2 eq./m^3]	Full Lifecycle GWP-tot[1] [kg CO_2 eq./m^3]	Application
COLUMNS & WALLS 65 Mpa	EPD-IES-0018934:001	65	350	369	Column & Wall
COLUMNS & WALLS 80 Mpa	EPD-IES-0018935:001	80	438	455	Column & Wall
COREMASTA 20MPA	EPD-IES-0018887:001	20	265	281	Blockfill
COREMASTA 25MPA	EPD-IES-0018888:001	25	287	302	Blockfill
COREMASTA 32MPA	EPD-IES-0018889:001	32	317	331	Blockfill
COREMASTA 40MPA	EPD-IES-0018890:001	40	315	334	Blockfill
Corewall 50MPa (15 Mpa @ 24 hours)	EPD-IES-0018921:001	50	456	471	Corewall
Corewall 65MPa (15 Mpa @ 24 hours)	EPD-IES-0018922:001	65	469	485	Corewall
EASYCRETE 20MPa	EPD-IES-0018895:001	20	238	255	General
EASYCRETE 20MPa GP	EPD-IES-0018891:001	20	288	302	General
EASYCRETE 20MPa GP Sureset Bronze	EPD-IES-0018892:001	20	293	308	General
EASYCRETE 25MPa	EPD-IES-0018896:001	25	302	316	General
EASYCRETE 25MPa GP	EPD-IES-0018893:001	25	318	332	General
EASYCRETE 25MPa GP Sureset Bronze	EPD-IES-0018894:001	25	326	340	General
ENRICH-30 FOOTING 20MPA	EPD-IES-0018899:001	20	203	222	Footing
ENRICH-30 FOOTING 25MPA	EPD-IES-0018902:001	25	225	242	Footing
ENRICH-30 FOOTING 32MPA	EPD-IES-0018905:001	32	258	274	Footing
Enrich-30 Normal-Class 20 MPa	EPD-IES-0018911:001	20	206	225	General
Enrich-30 Normal-Class 25 MPa	EPD-IES-0018913:001	25	227	245	General
Enrich-30 Normal-Class 32 Mpa	EPD-IES-0018915:001	32	259	275	General

[1]More detailed information is provided in the mix-specific tables and assumptions covered in Life Cycles & Processes section.

Product Environmental Performance

The EPD values presented are indicative of local material performance at the time of publishing and are subject to change based on material availability and seasonal factors.

Product Identification	EPD Registration Number	Compressive strength [MPa]	A1-A3 GWP-tot[1] [kg CO_2 eq./m^3]	Full Lifecycle GWP-tot[1] [kg CO_2 eq./m^3]	Application
Enrich-30 Normal-Class 40 MPa	EPD-IES-0018917:001	40	299	319	General
Enrich-30 Normal-Class 50 MPa	EPD-IES-0018919:001	50	351	369	General
ENRICH-40 FOOTING 20MPA	EPD-IES-0018900:001	20	168	189	Footing
ENRICH-40 FOOTING 25MPA	EPD-IES-0018903:001	25	185	208	Footing
ENRICH-40 FOOTING 32MPA	EPD-IES-0018906:001	32	211	230	Footing
Enrich-40 Normal-Class 20 MPa	EPD-IES-0018912:001	20	171	192	General
Enrich-40 Normal-Class 25 MPa	EPD-IES-0018914:001	25	187	208	General
Enrich-40 Normal-Class 32 MPa	EPD-IES-0018916:001	32	213	232	General
Enrich-40 Normal-Class 40 MPa	EPD-IES-0018918:001	40	246	268	General
Enrich-40 Normal-Class 50 MPa	EPD-IES-0018920:001	50	286	307	General
ENRICH-50 FOOTING 20MPA	EPD-IES-0018901:001	20	136	159	Footing
ENRICH-50 FOOTING 25MPA	EPD-IES-0018904:001	25	149	171	Footing
ENRICH-50 FOOTING 32MPA	EPD-IES-0018907:001	32	170	191	Footing
FOOTING 20MPA	EPD-IES-0018908:001	20	227	245	Footing
FOOTING 25MPA	EPD-IES-0018909:001	25	251	267	Footing
FOOTING 32MPA	EPD-IES-0018910:001	32	289	303	Footing
FOOTPAVE 20MPA	EPD-IES-0018897:001	20	292	306	Footpath
FOOTPAVE 25MPA	EPD-IES-0018898:001	25	323	336	Footpath
IMAGECRETE 25MPA LAKELANDS WHITE	EPD-IES-0018923:001	25	267	282	Decorative
IMAGECRETE 25MPA MADORA BAY WHITE	EPD-IES-0018926:001	25	263	278	Decorative

[1]More detailed information is provided in the mix-specific tables and assumptions covered in Life Cycles & Processes section.

Product Environmental Performance

The EPD values presented are indicative of local material performance at the time of publishing and are subject to change based on material availability and seasonal factors.

Product Identification	EPD Registration Number	Compressive strength [MPa]	A1-A3 GWP-tot[1] [kg CO_2 eq./m^3]	Full Lifecycle GWP-tot[1] [kg CO_2 eq./m^3]	Application
IMAGECRETE 25MPA OYSTER WHITE	EPD-IES-0018924:001	25	267	282	Decorative
IMAGECRETE 25MPA TAMBURRI WHITE	EPD-IES-0018925:001	25	263	278	Decorative
KERB MACHINE-PLACED 25MPA	EPD-IES-0018927:001	25	252	268	Kerb
KERB MACHINE-PLACED 32MPA	EPD-IES-0018928:001	32	286	301	Kerb
LIQUIFILL	EPD-IES-0018954:001	No guarenteed strength	81	100	Liquifill
MRWA PILING 40MPA [PL404AH30]	EPD-IES-0018936:001	40	315	334	MRWA Piling
MRWA PILING 50MPA [PL504AD22]	EPD-IES-0018937:001	50	338	356	MRWA Piling
MRWA PILING 65MPA [PL654AB54]	EPD-IES-0018938:001	65	416	432	MRWA Piling
MRWA PILING 50MPA - MLH [ZTPIL50A]	EPD-IES-0018955:001	50	217	240	MRWA Piling
MRWA PILING 65MPA - MLH [PL654AD10]	EPD-IES-0018939:001	65	233	256	MRWA Piling
MRWA S40 GB [ZWR4020B]	EPD-IES-0018957:001	40	323	343	MRWA Structural
MRWA S65 GB [ZWR654AB]	EPD-IES-0018962:001	65	355	373	MRWA Structural
MRWA S40 GP [ZWR402DA]	EPD-IES-0018959:001	40	441	456	MRWA Structural
MRWA S50 GP [ZWR502CA]	EPD-IES-0018960:001	50	463	477	MRWA Structural
MRWA S40 LH (GP+ SLAG) [ZWR402BB]	EPD-IES-0018958:001	40	210	233	MRWA Structural
MRWA S40 LH (GP+FLYASH) [ZZP40AR91]	EPD-IES-0018964:001	40	278	297	MRWA Structural
MRWA S50 LH (GP+ SLAG) [ZWR502CB]	EPD-IES-0018961:001	50	220	243	MRWA Structural
MRWA S50 LH (GP+FLYASH) [ZZP50AJ66]	EPD-IES-0018965:001	50	324	343	MRWA Structural
MRWA S50 MLH [WA502AC55]	EPD-IES-0018953:001	50	202	225	MRWA Structural
Normal-Class 20 MPa	EPD-IES-0018929:001	20	230	247	General

[1]More detailed information is provided in the mix-specific tables and assumptions covered in Life Cycles & Processes section.

Product Environmental Performance

The EPD values presented are indicative of local material performance at the time of publishing and are subject to change based on material availability and seasonal factors.

Product Identification	EPD Registration Number	Compressive strength [MPa]	A1-A3 GWP-tot[1] [kg CO_2 eq./m^3]	Full Lifecycle GWP-tot[1] [kg CO_2 eq./m^3]	Application
Normal-Class 25 MPa	EPD-IES-0018930:001	25	253	270	General
Normal-Class 32 MPa	EPD-IES-0018931:001	32	290	305	General
Normal-Class 40 MPa	EPD-IES-0018932:001	40	308	327	General
Normal-Class 50 MPa	EPD-IES-0018933:001	50	362	379	General
Post-tensioned 40 MPa (22 MPa @ 2 days)	EPD-IES-0018941:001	40	420	435	Post-Tensioned Slab
Post-tensioned 40 MPa (22 MPa @ 3 days)	EPD-IES-0018940:001	40	411	427	Post-Tensioned Slab
Post-tensioned 50 MPa (22 MPa @ 2 days)	EPD-IES-0018943:001	50	462	476	Post-Tensioned Slab
Post-tensioned 50 MPa (22 MPa @ 3 days)	EPD-IES-0018942:001	50	447	462	Post-Tensioned Slab
SLABMASTA/PMP 25MPa	EPD-IES-0018944:001	25	247	264	General
SLABMASTA/PMP 32MPa	EPD-IES-0018945:001	32	283	299	General
SLABMASTA/PMP 40MPa	EPD-IES-0018946:001	40	294	313	General
SLIPFORM BARRIER KERB 32MPA	EPD-IES-0018956:001	32	277	292	Kerb
SOFTPILE 20MPa	EPD-IES-0018963:001	20	235	251	Piling
SPRAYMASTA 25MPa	EPD-IES-0018947:001	25	305	319	Shotcrete
SPRAYMASTA 32MPa	EPD-IES-0018948:001	32	323	336	Shotcrete
SPRAYMASTA 40MPa	EPD-IES-0018949:001	40	341	358	Shotcrete
STABILISED SAND 7%	EPD-IES-0018950:001	No guarenteed strength	54	75	Stabilised materials
TILT-UP 32MPA	EPD-IES-0018951:001	32	356	368	Tilt-up
TILT-UP 40MPA	EPD-IES-0018952:001	40	426	442	Tilt-up

[1]More detailed information is provided in the mix-specific tables and assumptions covered in Life Cycles & Processes section.

Heidelberg Materials

References

EPD Owner	Heidelberg Materials Australia Pty Ltd L14, 35 Clarence St, Sydney NSW 2000 Phone: 1300 136 464 Online: www.heidelbergmaterials.com.au	
Programme Operator	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden Online: www.environdec.com Email: info@environdec.com	
Regional Programme	EPD Australasia Limited, 315a Hardy St, Nelson 7010 New Zealand Online: epd-australasia.com Email: info@epd-Australasia.com	
Process EPD Certified By	Megan Blizzard Epsten Group, Inc. 101 Marietta St. NW, Suite 2600, Atlanta, Georgia 30303, USA www.epstengroup.com Accredited by: A2LA, Certificate #3142.03	
Product Category Rules	CEN standard EN 15804:A2 (PCR 2019:14 Construction Products, Version 1.3.4) served as the core PCR. Environdec c-PCR-003 Concrete, concrete elements (EN 16757:2023) served as sub-PCR.	
EN 15804 PCR Review	The Technical Committee of the International EPD®System. Chair: Claudia A. Peña. The review panel may be contacted via info@environdec.com.	
EPD Registration Number	EPD-IES-0018963:001	
Independent Verification of the Declaration and Data, According to ISO 14025:	☒ EPD process certification ☐ EPD verification	
Valid From	2025-05-02	
Valid To	2030-05-02	
Version	1.0 2025-05-02	
Description of Version Differences (if NOT VERSION 1.0)	NA	
Geographical Scope	WESTERN AUSTRALIA - PERTH	
Important Notes	EPDs within the same product category but from different programmes may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804. The EPD Owner maintains full ownership, liability and responsibility for the EPD.	
Product Group Classification	UN CPC 88 - Concrete, cement and plaster article manufacturing services	
ANZSIC Classification	2033 Ready Mix Concrete Manufacturing	

References

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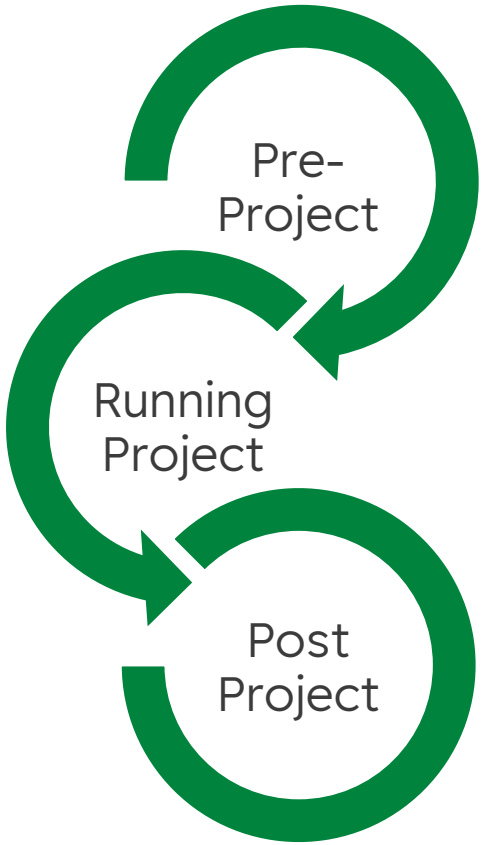
CO_2 Service Offer



CO_2 is set to become a crucial budgeting currency in the construction sector. As such, it must be managed accordingly. Most provided embodied carbon emission data out there is based on estimates and typically handed over to the customer before a project starts.

At Heidelberg Materials Australia, we believe there's a better way to communicate carbon values, which also eliminates the current gap of carbon monitoring options during the construction phase in the market:

1) **Pre-project:** Predicting - We can provide you indicative CO_2 values for your specific project with our 3rd party verified CO_2 calculator (targeted & fast & reliable).

2) **Running project:** Monitoring - You get regular updates of your deliveries and how you track towards your carbon targets (no more surprises).

3) **Post-project:** Verification - You'll receive a final report and a project-specific EPD based on actual deliveries (highest accuracy).