



Building
something
great

Pre-mix concrete EPD

Environmental Product Declaration

Queensland (QLD) region



In accordance with ISO 14025 and EN 15804

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 Registration Number S-P-02339 (Version 1.1)

Issued: 25 November 2021 | **Revised:** 15 September 2023 | **Valid until:** 25 November 2026 | **Geographical scope:** QLD region





Contents





Program information and verification	1
About Boral.....	3
Geographical scope	8
Declared products	11
Pre-mix concrete production	15
ENVISIA® case study	16
Cradle-to-gate life cycle	18
Life Cycle Assessment (LCA) methodology	21
Product composition.....	23
Declared unit	24
Environmental indicators	25
Environmental profiles	26
Brisbane region.....	27
Brisbane and Gold Coast region.....	39
Sunshine Coast region	51
Darling Downs region	62
Central Queensland region.....	73
Townsville region	84
North Queensland region	95
Other environmental information.....	106
Our approach to climate related risks	107
References	109

Program 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, ISO 14040 and ISO 14044 as they enable transparency and comparability between EPDs. This EPD provides environmental indicators for Boral ENVISIA® ENVIROCRETE®, ENVIROCRETE® PLUS, products for special applications and our normal class of pre-mix concrete products manufactured in Australia. This EPD is a 'cradle-to-gate' declaration covering production of the concrete and its supply chain.

This EPD is verified to be compliant with EN 15804. EPD of construction products may not be comparable if they do not comply with EN 15804. EPDs within the same product category but from different programs or utilising different PCRs may not be comparable. Boral, as the EPD owner, has the sole ownership, liability and responsibility for the EPD.

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Program information and verification

EPD version:	Description of the changes
Version 1.1	<p>The following edits were made as part of the first annual review.</p> <ul style="list-style-type: none"> • Address for Boral has been updated. • The map showing the number of operating sites has been updated. • Organisation acronyms have been changed (ISC etc). • The branding was updated. • Minor discrepancies between the GWP summary tables and results tables have been corrected. In all relevant instances, the incorrect values in the GWP summary tables were 1kg CO₂e / m³ higher than the corresponding results tables.
Reference year for data:	2018-01-01/2018-12-31

CEN standard EN 15804 served as the core PCR

PCR	<p>PCR 2012:01 Construction Products and Construction Services, Version 2.33, 2020-09-18</p> <p>PCR 2012:01-SUB-PCR-G Concrete and concrete elements, 2020-09-18</p>
PCR review was conducted by	The Technical Committee of the International EPD® System. Chair: Massimo Marino. Contact via info@environdec.com
Independent verification of the declaration and data, according to ISO 14025	<input type="checkbox"/> EPD process certification (Internal) <input checked="" type="checkbox"/> EPD verification (External)
Procedure for follow-up of data during EPD validity involved third-party verifier	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes



About Boral

Boral is the largest integrated construction materials company in Australia, with a leading position underpinned by strategically located quarry reserves and an extensive network of operating sites. We also manufacture and supply a range of building products.

Boral Concrete has over 200 pre-mix concrete plants around Australia producing a wide range of concrete mixes in metropolitan and country areas.

In Queensland, Boral Concrete supplies pre-mix concrete to all segments of the construction industry including infrastructure, social, commercial, and residential construction.

This EPD covers the majority of the concrete products supplied from Boral plants in Queensland.

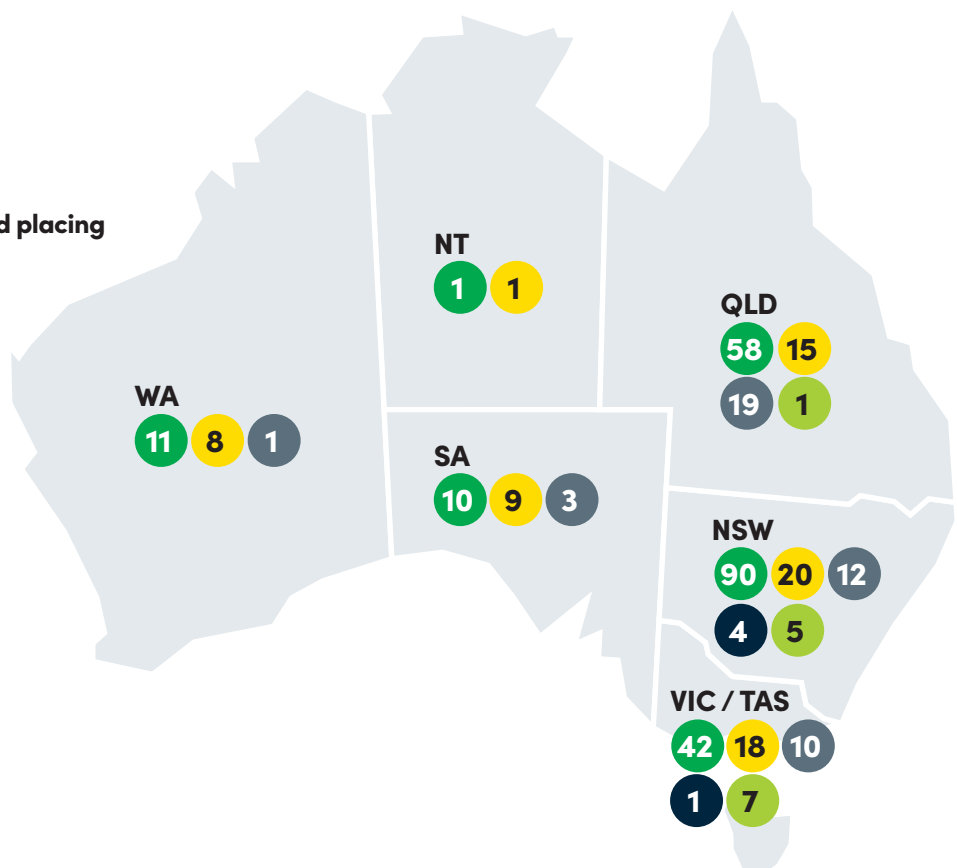
Construction materials Leading integrated network

346

Operating sites*

- 212** Concrete and placing
- 71** Quarries
- 45** Asphalt
- 5** Cement
- 13** Recycling

* Includes transport, fly ash and research and development sites.



About Boral

How we work

ZERO HARM
TODAY

At Boral, we have a culture of ‘working together’ with a focus on Zero Harm Today.

This ensures all of our employees, contractors, partners and communities in which we operate are free from harm, injury and illnesses.

Boral has a team of full-time Health, Safety, Environment and Quality specialists who operate across our integrated business, offering a single interface for safety communications and innovation across raw materials, logistics, operations and placement.

Innovation and technical capability

The Innovation Factory is Boral’s in-house centre of excellence responsible for developing advanced cement and concrete solutions for our customers.

Through consultation with our customers, the Innovation Factory is central to enabling transformation through innovative products at Boral.

Our focus on engagement and action is backed by intensive research and development through our dedicated and talented team who work in collaboration with many sections of the company to create a world of future generations will be proud of.



About Boral

Technical services

As one of Australia's largest construction materials companies, Boral is committed to excellence, providing customers with quality products and reliable service.

"Boral Materials Technical Services is also the largest facility of its kind in the country."

Our aim is to provide products backed up by specialised testing as well as extensive quality control testing and technical support.

To ensure we remain at the forefront, we constantly improve, develop and refine our products to maintain the high standards customers have come to expect.

Our production, technical and quality managers are committed to quality excellence in our manufacturing process. We have committed additional resources to research and we strive to develop whole-of-life solutions that offer a sustainable future. Our innovative products are designed in collaboration with our clients.

Not only are we the only Australian construction materials company to maintain a full-service construction materials laboratory in Australia, **Boral Materials Technical Services is also the largest facility of its kind in the country**, providing special and standard testing and product development services to Boral and our customers.

Boral maintains an ISO 9001-certified Quality System to ensure we conduct a regular regime of physical properties testing on all materials to certify they:

- meet Australian Standards in the civil and structural construction industry
- comply with applicable legislation, regulations and industry standards
- meet project specifications
- allow for continuous improvement.

Boral laboratory facilities have a quality management system that meets international standards and they are NATA-accredited for construction materials testing and chemical testing. These customer-focused services have earned Boral the reputation of a market leader in its approach.



About Boral

Sustainability at Boral

We recognise that our commitment and progress in managing sustainability outcomes is vital to our business and meeting the expectations of our customers.

We strive to:

- **Deliver** innovative, superior performing and more sustainable products and solutions that respond to a changing world and better meet our customers' needs
- **Drive** safety performance towards world's best practice and invest in our people to enable them to deliver on our strategy
- **Reduce** our environmental footprint and build our resilience to climate impacts
- **Be** a socially responsible member of the communities in which we operate.

In recent years, we have substantially reshaped our business to respond and adapt to changing commercial, technological, and environmental factors. We have invested in growing our lower carbon concrete products.

We are increasing our investment in innovation to enable us to expand our products and solutions that have a lower carbon footprint and thereby positively contribute to an effective transition to a lower carbon economy.

Boral's ENVISIA® and ENVIROCRETE® / PLUS products underpin this improved sustainable concrete range. We monitor and report on our sustainability performance to drive progress and continuous improvement and are responding to increasing expectations of our customers on the disclosure of our sustainability risks and opportunities.



About Boral



ZERO HARM TODAY

Our commitment

Our overarching goal is to deliver Zero Harm Today. This means we target zero injuries to our people and seek to eliminate adverse environmental impacts.

Where elimination is not possible, we seek to minimise any harmful effects from our operations. At an absolute minimum, this means complying with environmental legislation, regulations, standards and codes of practice.

- **Reducing greenhouse gas** emissions from our processes, operations and facilities.
- **Reducing waste** in all forms including through the efficient use of energy, conservation of water, minimising and recycling waste materials and energy, prevention of pollution, and effective use of virgin and recovered resources and supplemental materials.
- **Protecting biodiversity** values at and around our facilities.
- **Openly and constructively engaging** with communities surrounding our operations.

Geographical scope

Queensland region



The concrete plants considered for this Environmental Product Declaration comprise those in the state of Queensland. Individual plants were assessed for life cycle assessment, and local surrounding similar raw material sources were included in the datasets. These modelled plants, including geographically nearby plants are listed in the following location maps.

Plants covered by this EDP

- Boral Concrete Brisbane – **Eagle Farm**
- Boral Concrete Brisbane South and Gold Coast – **Cleveland**
- Boral Concrete Darling Downs – **Toowoomba**
- Boral Concrete Central Qld – **Hervey Bay**
- Boral Concrete Sunshine Coast – **Maroochydore**
- Boral Concrete Townsville – **Garbutt**
- Boral Concrete North Qld – **Cairns**

Legend

- Plants that are being modelled in QLD region EPD.
- Surrounding plants covered in QLD region EPD scope.
- Out of scope for the QLD region EPD.

Geographical scope

Queensland region



Brisbane, QLD






Brisbane South and Gold Coast, QLD

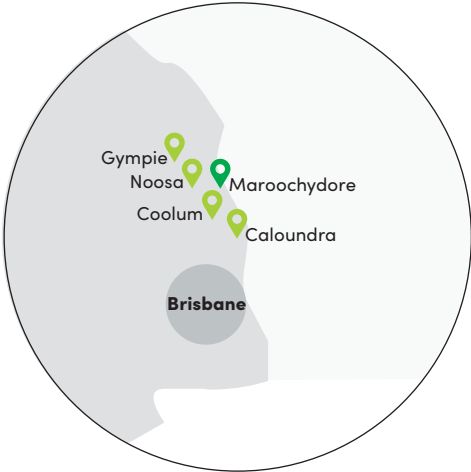


Darling Downs, QLD

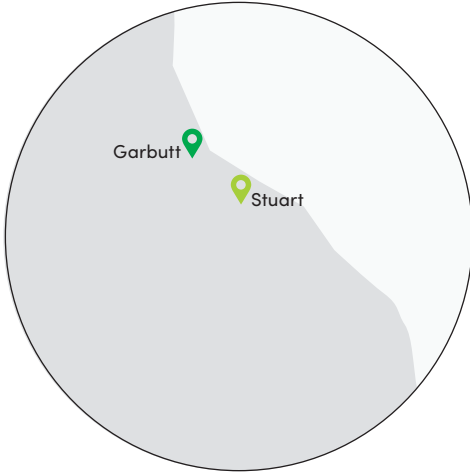
Legend

-  Plants that are being modelled in QLD region EPD.
-  Surrounding plants covered in QLD region EPD scope.
-  Out of scope for the QLD region EPD.

Geographical scope



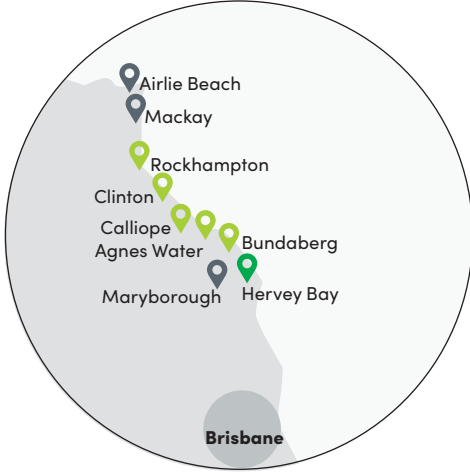
Sunshine Coast, QLD



Townsville, QLD






North Queensland



Central Queensland

Legend

-  Plants that are being modelled in QLD region EPD.
-  Surrounding plants covered in QLD region EPD scope.
-  Out of scope for the QLD region EPD.

Declared products

Products considered for the QLD region EPD

The products considered for the EPD fall into three broad categories: **normal class products, lower carbon concrete products and special concrete products.**

A brief description of each category is given below, followed by a full list of the products.

1) Normal class concrete products

Normal class concrete products are suitable for general applications and designed to meet the requirements of AS 1379 (Specification and supply of concrete). The normal class concrete products have been grouped according to the cement blend they contain as follows.

Normal class concrete category	Cementitious type
NORMAL CLASS GP BLEND	General Purpose (GP) cement
NORMAL CLASS GP / FA BLEND	General Purpose (GP) cement and fly ash (FA)

2) Lower carbon concrete products

Lower carbon concrete products have been designed to have lower portland cement contents and lower embodied carbon contents. The lower carbon concrete products have been further categorised according to their portland cement reduction and their performance, as per the sub categories below.

Lower carbon concrete product	Portland cement reduction*	Typical properties
ENVIROCRETE®	≥40%	<ul style="list-style-type: none"> Complies with AS 1379.
ENVIROCRETE® PLUS	≥45%	<ul style="list-style-type: none"> Complies with AS 1379. Applicable for Green Star projects. Improved early age strength and drying shrinkage compared to the ENVIROCRETE® products.
ENVISIA®	≥50%	<ul style="list-style-type: none"> Complies with AS 1379. Applicable for Green Star projects. Improved early age strength and drying shrinkage compared to the ENVIROCRETE® and ENVIROCRETE® PLUS products.

*The percentages indicate the typical portland cement reduction against default concrete mixes as defined in the Green Star and IS Rating tools by the Green Building Council of Australia (GBCA) and the infrastructure Sustainability Council (ISC) respectively.

Declared products

ENVIROCRETE® concrete

Boral's ENVIROCRETE® concrete is a lower carbon concrete product which complies with AS 1379.

It contains supplementary cementitious materials to reduce the portland cement content and the embodied carbon content of the concrete and is suitable for projects targeting a lower carbon footprint.

ENVIROCRETE® has a minimum portland cement reduction of 40% when compared to the GBCA reference case and is suitable for projects targeting a Green Star rating and where good early age strength or low drying shrinkage are not required.

ENVIROCRETE® PLUS concrete

Boral's ENVIROCRETE® PLUS concrete is a lower carbon concrete product which complies with AS 1379.

It contains supplementary cementitious materials to reduce the portland cement and the minimum reduction in portland cement compared to the GBCA and ISC reference case is 45%. ENVIROCRETE® Plus also has enhanced engineering properties compared to the ENVIROCRETE® range. The early age strength and drying shrinkage are superior to ENVIROCRETE®.



Declared products

ENVISIA® concrete

Boral's ENVISIA® concrete is a lower carbon concrete product which complies with AS 1379 and has excellent engineering properties. It contains supplementary cementitious materials to reduce the portland cement and the minimum portland cement reduction compared to the GBCA and ISC reference case is 50%. ENVISIA® combines a proprietary cement technology (ZEP®) which gives it good early age strength, low shrinkage characteristics and excellent durability characteristics. An overview of the sustainability, durability, engineering and architectural properties are given below.

Lower carbon

- ENVISIA® has a low portland cement content and is suitable for projects seeking to maximise the number of green star points from concrete.
- ENVISIA® has a lower carbon content and is suitable for projects seeking a rating with the Green Building Council of Australia (GBCA) or the Infrastructure Sustainability Council (ISC).

Workability

- ENVISIA® can be placed, pumped and finished like conventional concrete.

Superior engineering properties

- ENVISIA® will achieve early-age strength equivalent to conventional concrete mixes with higher portland cement content (e.g. post-tensioned and precast concrete.)
- ENVISIA® has 20 percent greater flexural strength compared to conventional concrete of the same grade.
- ENVISIA® achieves up to 50 percent reduction in shrinkage when compared to conventional sustainable concrete mixes. The low shrinkage of ENVISIA® will allow for more engineering options such as the design of larger slabs with fewer joints.

Superior durability

- ENVISIA® provides improved durability, through greater protection to steel reinforcement against chloride induced corrosion.
- ENVISIA® has improved sulphate and acid resistance properties.
- ENVISIA® mitigates the potential expansion due to alkali aggregate reactivity.

Architectural presence

- ENVISIA® can achieve a range of architectural benefits because of its off-form finish and lighter colour.
- ENVISIA®'s lighter colour will enhance the use of coloured oxides.



Declared products

3) Concrete products for special applications

Boral's special concrete products have been designed to meet specific project requirements in addition to the requirements of AS 1379. They include products that have been designed for infrastructure projects, multi-residential buildings, commercial buildings and civil works.

Products covered by this Environmental Product Declaration (EPD)

The products covered in the EPD are listed below. The environmental impacts of products not referenced in the EPD can be provided on request. Boral is developing an environmental impact calculator allowing us to provide environmental profiles for virtually any mix design from any of our concrete plants in Australia. We intend to have the calculator independently verified in line with the same standards this EPD is based on, so that the results are of similar standing.

1) Normal class concrete products

- NORMAL CLASS GP BLEND 20 MPa
- NORMAL CLASS GP BLEND 25 MPa
- NORMAL CLASS GP BLEND 32 MPa
- NORMAL CLASS GP BLEND 40 MPa
- NORMAL CLASS GP BLEND 50 MPa
- NORMAL CLASS GP / FA BLEND 20 MPa
- NORMAL CLASS GP / FA BLEND 25 MPa
- NORMAL CLASS GP / FA BLEND 32 MPa
- NORMAL CLASS GP / FA BLEND 40 MPa
- NORMAL CLASS GP / FA BLEND 50 MPa

2) Lower carbon concrete products

- ENVISIA® 20 MPa
- ENVISIA® 25 MPa
- ENVISIA® 32 MPa
- ENVISIA® 40 MPa
- ENVISIA® 50 MPa
- ENVIROCRETE® PLUS 20 MPa
- ENVIROCRETE® PLUS 25 MPa
- ENVIROCRETE® PLUS 32 MPa
- ENVIROCRETE® PLUS 40 MPa
- ENVIROCRETE® PLUS 50 MPa
- ENVIROCRETE® 20 MPa
- ENVIROCRETE® 25 MPa
- ENVIROCRETE® 32 MPa
- ENVIROCRETE® 40 MPa
- ENVIROCRETE® 50 MPa

3) Concrete products for special applications

- MTRS 70 / 40 MPa PUMP B1 EXP
- MTRS 70 / 40 MPa PUMP B2 EXP
- MTRS 70 / 40 MPa PUMP / TREMIE B2 EXP
- MTRS 70 / 50 MPa TREMIE B2 EXP
- MTRS 70 / 50 MPa TREMIE C1 EXP
- ASPIRE® 40 GPa – 65 MPa
- ASPIRE® 45 GPa – 80 MPa
- ASPIRE® 50 GPa – 100 MPa
- HIGH SLUMP 40 MPa
- HIGH SLUMP 50 MPa
- HIGH SLUMP 65 MPa
- HIGH SLUMP 80 MPa
- POST TENSIONED 40 MPa 22@3
- POST TENSIONED 40 MPa 22@4
- SHOTCRETE 32 MPa
- KERB MACHINE 280kg
- KERB MACHINE 320kg
- LEAN MIX 20:1
- NO FINES 6:1
- STABILISED SAND 10:1
- STABILISED SAND 12:1
- STABILISED SAND 14:1

Pre-mix concrete production

Concrete production is the process of combining water, aggregates, cementitious binders and additives. These different 'ingredients' are mixed at a specialised facility known as a 'batching' plant.

A batching plant stores the ingredients in cement silos, aggregate bins and admixture tanks. The plants use calibrated weigh scales and flow meters to accurately weigh the ingredients which are then mixed in a mixer compliant with item C3 of AS 1379. Most concrete plants mix the concrete in a transit mixer (concrete truck) which then delivers the concrete to the project. However, some plants use a stationary mixer before discharging the mixed concrete into a concrete truck which then delivers the concrete to the project.

Depending on the proposed application of the final product, the concrete may contain other ingredients such as colour oxides and fibres and the production process may include heaters or chillers. Concrete production is time-sensitive, once the ingredients are mixed, workers must put the concrete in place before it loses workability.



"A batching plant stores the ingredients in cement silos, aggregate bins and admixture tank."

ENVISIA® case study



Building something great

Case study

ENVISIA® / ASPIRE® Concrete

Overview

Customer

Mirvac Group contract through East Coast Concrete Contractors

Project name

80 Ann Street

Segment

Commercial

Location

Brisbane CBD, Queensland

Concrete / Volume

ENVISIA® (Flatwork and Infills)

ASPIRE® (Vertical elements)



SEGMENT



COMMERCIAL

VOLUME

45,000m³

Mirvac – 80 Ann Street, Brisbane Queensland

Project

80 Ann Street is a 35 Level, 60,000m² premium office building in Brisbane's CBD with dual frontage to Turbot and Ann Street. Supply commenced late 2019 and to date, Boral has supplied over 45,000m³ of ENVISIA® and ASPIRE® mixes.

What was the customer looking for:

- The leasing client (Suncorp) insisted on using suppliers that would help achieve a 6-Star rating (the first for Brisbane).
- Mirvac wanted lower carbon construction materials in line with their corporate sustainability commitments.
- Design shrinkage maximum 600 microstrain.
- Good early age strength to ensure the program wasn't impacted.

What could Boral offer:

- Historical performance with ASPIRE® on the 300 George project opened the conversation, which led to ENVISIA® discussions, and then finally to securing the work through the placer – East Coast Concrete Contractors.
- ENVISIA® – drying shrinkage nominal 400–550 microstrain @56 days and minimum portland cement reduction of 50% compared with Green Building Council of Australia reference case.
- ASPIRE® – very high strength mixes, with high modulus of elasticity and low shrinkage, and lower overall Portland Cement compared to equivalent high strength.

Customer benefit

- Using ENVISIA® and ASPIRE® instead of conventional concrete significantly reduced the buildings carbon footprint.
- Core Filled Tube (CFT) Columns: ASPIRE® 50 pumped from bottom, 4 inch inlet, 20m tall x 1.8m diameter CFT columns. 36m³ approximately to fill each. Pump operators reported nil increase in pump pressure when constant supply maintained, ASPIRE® mix performed well with no issues over the 18 CFT Columns.
- Improved program efficiency and reduced timeline stress and costs. ASPIRE® has high early strength and low shrinkage was maintained with a high supplementary cementitious materials replacement for Green Star. Conventional jump climbs normally scheduled at minimum three days, with Aspire® not a single pour failed to reach one day strength in time. Jumps climbed on day one or two.
- Early strength on the ENVISIA® for decks allowed final stress of PT to be completed on day two or three, in some cases an initial stress in the morning and final in the afternoon.

For more information please visit boral.com.au/lcc

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ENVISIA® case study



Building
something
great

Case study

ENVISIA® / ASPIRE® Concrete

Testimonials

Superior performance backed up by Qld's Best Service. Both innovative products delivered higher technical performance than required and is now a go to product across our business. A huge thanks to the team at Boral!

Conan Butler,
East Coast Concrete Contractors

We were impressed by the early strengths we achieved through the Boral ENVISA and Aspire mix, which has provided a number of key program benefits. The 450 micro-strain achieved on the column load also allowed for significantly lower axial shortening, which improved the differential long-term deflection of the slab.

Trent Boatwright,
Senior Project Manager, Mirvac

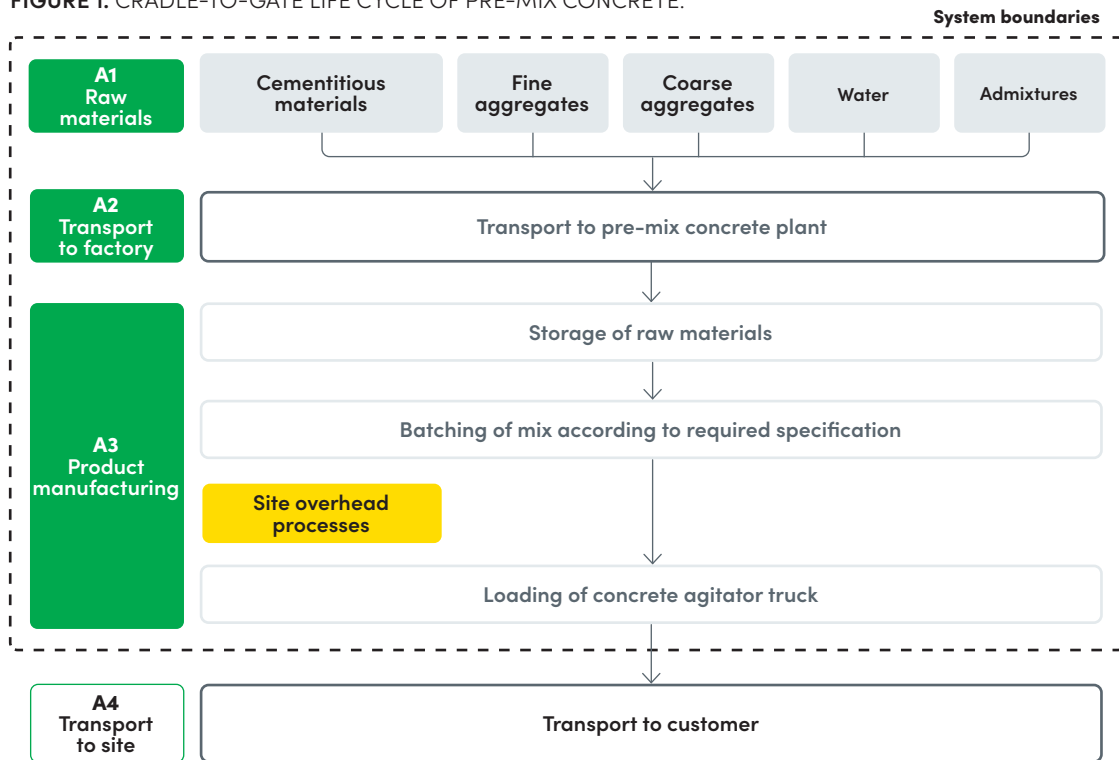
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Cris Johansen,
Development Director, Mirvac

Cradle-to-gate life cycle

This EPD covers the cradle-to-gate life cycle stages (A1-A3), as per diagram below. Downstream stages have not been included.

FIGURE 1. CRADLE-TO-GATE LIFE CYCLE OF PRE-MIX CONCRETE.



Raw material stage (A1)

All raw materials used in the production of Boral's normal class concrete, lower carbon concrete and special concrete products comply with the following standards as required by AS 3600 Concrete Structures (SA 2018) and AS 1379 Specification and Supply of Concrete (SA 2007/R2017):

- **AS 3972:** General purpose and blended cements
- **AS 3582.1** Supplementary cementitious materials Part 1: Fly Ash
- **AS 3582.2** Supplementary cementitious materials Part 2: Slag – Ground granulated blast furnace
- **AS 2758.1** Aggregates and rock for engineering purposes Part 1: Concrete Aggregates
- **AS 1478.1** Chemical admixtures for concrete, mortar and grout

Cradle-to-gate life cycle

Transportation stage (A2)

Raw materials are typically transported to our sites via rigid trucks. Coarse aggregates, manufactured sands and natural sands are sourced from our network of quarries, as well as third-party quarries. General Purpose Cement (GP) and Ground Granulated Blast Furnace Slag (GGBFS) are supplied by local suppliers in Queensland using local or imported ingredients and delivered to our sites in rigid trucks. Fly ash is sourced from local power stations.

ZEP® additive and silica fume are mostly imported. Admixtures are sourced from locally based suppliers and transported using rigid trucks.

TABLE 1. SCOPE OF EPD

Product stage			Construction stage		Use stage							End-of-life stage				Benefits beyond system boundary
RAW MATERIAL SUPPLY	TRANSPORT	MANUFACTURING	TRANSPORT	CONSTRUCTION-INSTALLATION PROCESS	USE	MAINTENANCE	REPAIR	REPLACEMENT	REFURBISHMENT	OPERATIONAL ENERGY USE	OPERATIONAL WATER USE	DECONSTRUCTION DEMOLITION	TRANSPORT	WASTE PROCESSING	DISPOSAL	REUSE, RECOVERY, RECYCLING POTENTIAL
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
			Scenario		Scenario							Scenario				
✓	✓	✓	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

✓ = module is included in this study MND = module is not declared*

* When a module is not accounted for, the stage is marked with "MND" (Module Not Declared).
MND is used when we cannot define a typical scenario.



Eagle Farm Batching Plant, QLD

Cradle-to-gate life cycle

Manufacturing stage (A3)

The typical manufacturing process of Boral's normal class concrete, lower carbon concrete and special concrete products is by mixing concrete constituents comprising of cement and supplementary cementitious materials (SCM) (AS 3972/AS 3582.1,2), and fine / coarse aggregates (AS 2758.1), plus admixtures / additives (AS 1478.1) and water (AS 1379) directly in the truck referred to as the dry batch method, or in selected locations pre-mixing in a wet mix fashion, before delivery by agitator truck.

The entire process is covered under AS 1379 Specification and Supply of concrete and verified by third party under ISO9001. This manufacturing stage (A3) includes activities associated with sourcing and delivery of individual concrete constituents, up to the point of mixing at the batch plant, but not including delivery and placement of concrete at the project location. This is typically described as the Cradle (A1) to Gate (A3) life cycle.



Life Cycle Assessment (LCA) methodology

Allocation

The key material production processes that require allocation are:

- **Pre-mix concrete:** Boral manufactures a range of pre-mix concrete products at its sites. At each manufacturing site, energy use for concrete production has been allocated to the products based on a volume basis (total m³ of pre-mix concrete products).
- **Aggregates:** aggregates are produced through crushing of rock, which is graded in different sizes. The energy required for the crushing and screening does not differentiate between products. Therefore, aggregate production (including manufactured sand) has been allocated based on the mass of product.
- **Silica fume (micro-silica):** is a by-product of silicon metal or ferrosilicon alloys production. Economic allocation was applied to attribute some of the impacts of ferrosilicon production to silica fume.
- **Blast Furnace Slag (BFS):** is a by-product from steel-making. 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.
- **Fly ash:** fly ash is a by-product from coal-fired power plants. We have used the AusLCI data for fly ash, in which all environmental impacts of the power plant are allocated to the main product: electricity. Fly ash has only received the burdens of transport to our sites.

The allocation assumptions were checked using sensitivity analyses, which showed that the allocation of fly ash can have an impact on the LCA results if impacts of electricity production are assigned to fly ash.

Cut-off criteria

- The contribution of capital goods (production equipment and infrastructure) and personnel is outside the scope of the LCA, in line with the PCR (Envirodec 2020a).
- The amount of packaging used for admixtures is well below the materiality cut-off. Nonetheless, packaging materials and quantities are included in the admixture EPD data.

Key assumptions

- **Admixture data:** are based on generic EPDs that are valid for a range of different chemicals, including the admixtures used by Boral. No EPD has been published for Viscosity Modifying Admixtures (VMA); we have used an average of the five admixture EPDs published by EFCA as a proxy.
- **Fly ash:** is considered a by-product of electricity generation that comes without prior environmental impacts. This allocation decision can have a significant effect on the environmental profile of products that use fly ash.
- **Water consumption:** is not measured consistently across quarries. We have used AusLCI water consumption data per tonne of coarse and fine aggregates instead.
- **Cement data:** are based on generic AusLCI data for cement produced from imported clinker.
- **Blast Furnace Slag:** slag receives some environmental impacts from pig iron production. This allocation decision has an effect on the environmental profile of products that use ground-granulated blast furnace slag (GGBFS).

Product composition

Content declaration (% by weight)

TABLE 2. QLD PRODUCT COMPOSITIONS

Constituent	NORMAL CLASS GP BLEND	NORMAL CLASS GP / FA BLEND	ENVIROCRETE®
General purpose cement	10-22%	7-16%	4-12%
Ground granulated blast furnace slag	-	-	2-7%
Fly ash	-	2-6%	1-5%
Silica fume	-	-	-
Coarse aggregate	38-50%	38-50%	38-50%
Manufactured sand	0-22%	0-22%	0-23%
Natural sand	10-40%	12-40%	10-40%
Admixtures	<0.15%	<0.15%	<0.25%
Water	6-9%	6-9%	6-9%

TABLE 3. CONTINUED QLD PRODUCT COMPOSITIONS

Constituent	ENVIROCRETE® PLUS*	ENVISIA®*	QLD TMR	Special
General purpose cement	4-10%	3-10%	10-16%	1-22%
Ground granulated blast furnace slag	4-10%	5-14%	0-4%	0-10%
Fly ash	1-3%	-	4-7%	0-6%
Silica fume	-	-	-	<1%
Coarse aggregate	38-50%	38-50%	40-50%	0-85%
Manufactured sand	0-23%	0-22%	0-18%	0-89%
Natural sand	10-40%	10-40%	12-35%	0-90%
Admixtures	<0.25%	<0.4%	<0.3%	<0.5%
Water	6-9%	6-9%	6-9%	2-9%

The products as supplied are non-hazardous. The products included in this EPD do not contain any substances of very high concern as defined by European REACH regulation in concentrations >0.1% (m/m).

* May include Zep® technology.

Declared unit

The background LCA serves as the foundation for this EPD. An LCA analyses the environmental processes in the value chain of a product. It provides a comprehensive evaluation of all upstream (and sometimes downstream) material and energy inputs and outputs. The results are provided for a range of environmental impact categories, in line with EN 15804 (CEN 2013).

Pre-mix concrete is available in various strength grades and with characteristics that are specifically designed for each application. The declared unit that covers all of the products is: 1 cubic metre (m³) of pre-mix concrete (as ordered by client) with a given strength grade and identifying characteristics. This declared unit has been adapted from the sub-PCR (Envirodec 2020b).

All results are presented per declared unit and cover the A1-A3 life cycle stages (cradle-to-gate).

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).



Environmental indicators

TABLE 4. IMPACT CATEGORIES INCLUDED IN THIS ASSESSMENT

Impact category	Acronym	Unit
Global warming potential	GWP	kg CO ₂ equivalents
Ozone depletion potential	ODP	kg CFC-11 equivalents
Acidification potential of soil and water	AP	kg SO ₂ equivalents
Eutrophication potential	EP	kg PO ₄ ³⁻ equivalents
Photochemical ozone creation potential	POCP	kg C ₂ H ₄ equivalents
Abiotic depletion potential for mineral elements	ADPE	kg Sb equivalents
Abiotic depletion potential for fossil fuels	ADPF	MJ

TABLE 5. PARAMETERS DESCRIBING RESOURCE USE, WASTE AND OUTPUT FLOWS

Resource use	Acronym	Unit
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

Environmental profiles

The cradle-to-gate (module A1–A3) environmental profiles and environmental parameters of each product group are expressed per m³ of pre-mix concrete (volume as ordered by the client).

Limitations

The results of this study and the EPD are valid for Boral products only. Products from other manufacturers will likely have different impacts due to differences in mix designs, supply chains and manufacturing processes. The main limitations of the LCA results are found in the parameter results, which are highly dependent on background data.

The environmental parameters are based on the life cycle inventory. There is some ambiguity around their presentation, and issues to note include:

- hazardous waste disposal (HWD) is derived from background LCI data
- non-hazardous waste disposal (NHWD) is derived from background LCI data
- radioactive waste disposal (RWD) is derived from background LCI data. Radioactive waste is only coming through the EPD data for admixtures, unless the life cycle contains clinker manufactured overseas.

Variation (A1–A3) Per impact category

The results of the LCA are based on data from one representative plant for each of the regions.

The environmental profiles of concrete manufactured at other plants in the same region are largely similar, with variations mainly due to differences in transport distances for raw materials supplied to the concrete plant. The largest variation for the concrete mixes^{*} is found in 20 MPa ENVISIA®, as this is the concrete product with the smallest footprint and the largest contribution from transport. The variation across included sites for other concrete products is considerably lower, and most mandatory indicators stay well within the ±10% range as required by the PCR (Environdec 2020a). We have analysed the maximum variation (caused by differences in transport) for each region:

- **Brisbane:** the variations for all plants covered in the Brisbane region stay within ±10% of the reported values for Eagle Farm.
- **Brisbane South and Gold Coast:** the variations for all concrete mixes and plants covered in the Brisbane and Gold Coast region stay within ±10% of the reported values for Cleveland, except for ozone layer depletion (20%) and photochemical oxidant creation (15%).
- **Sunshine Coast:** the variations for all concrete mixes and plants covered in the Sunshine Coast region stay within ±10% of the reported values for Maroochydore.
- **Darling Downs:** the variations for all concrete mixes and plants covered in the Darling Downs region stay within ±10% of the reported values for Toowoomba, except for ozone layer depletion (17%) and photochemical oxidant creation (14%).
- **Central Queensland:** the variations for all concrete mixes and plants covered in the Central Queensland region stay within ±10% of the reported values for Hervey Bay, except for ozone layer depletion (27%), photochemical oxidant creation (22%) and abiotic depletion (fossil fuels) (12%).
- **Townsville:** the variations for all concrete mixes and plants covered in the Townsville region stay within ±10% of the reported values for Garbutt.
- **North Queensland:** the variations for all concrete mixes and plants covered in the Northern Queensland region stay within ±10% of the reported values for Cairns, except for ozone layer depletion (26%), eutrophication (11%), photochemical oxidant creation (23%) and abiotic depletion (fossil fuels) (12%).

^{*} The variation for stabilised sand and lean mix 20:1 products is much more dependent on transport of aggregates and exceeds 10% in most cases. Specific data should be sought from Boral if these mixes are important for your footprint and are sourced from plants other than the representative plant that has been modelled.

Brisbane region

Environmental profiles and parameters



Product table list

Brisbane region

In each region, we start with presenting a summary of the carbon footprint (GWP summary) of our concrete mixes.

Lower carbon concrete products

Table No. 1 and 230

- ENVISIA® 20 MPa
- ENVISIA® 25 MPa
- ENVISIA® 32 MPa
- ENVISIA® 40 MPa
- ENVISIA® 50 MPa

Table No. 3 and 431

- ENVIROCRETE® PLUS 20 MPa
- ENVIROCRETE® PLUS 25 MPa
- ENVIROCRETE® PLUS 32 MPa
- ENVIROCRETE® PLUS 40 MPa
- ENVIROCRETE® PLUS 50 MPa

Table No. 5 and 632

- ENVIROCRETE® 20 MPa
- ENVIROCRETE® 25 MPa
- ENVIROCRETE® 32 MPa
- ENVIROCRETE® 40 MPa
- ENVIROCRETE® 50 MPa

Normal class concrete products

Table No. 7 and 833

- NORMAL CLASS GP BLEND 20 MPa
- NORMAL CLASS GP BLEND 25 MPa
- NORMAL CLASS GP BLEND 32 MPa
- NORMAL CLASS GP BLEND 40 MPa
- NORMAL CLASS GP BLEND 50 MPa

Table No. 9 and 1034

- NORMAL CLASS GP / FA BLEND 20 MPa
- NORMAL CLASS GP / FA BLEND 25 MPa
- NORMAL CLASS GP / FA BLEND 32 MPa
- NORMAL CLASS GP / FA BLEND 40 MPa
- NORMAL CLASS GP / FA BLEND 50 MPa

Concrete for special applications

Table No. 11 and 1235

- HIGH SLUMP 40 MPa
- HIGH SLUMP 50 MPa
- HIGH SLUMP 65 MPa
- HIGH SLUMP 80 MPa

Table No. 13 and 1436

- STABILISED SAND 10:1
- KERB MACHINE 280kg
- KERB MACHINE 320kg
- TMR MTRS 70 / 40 MPa 20mm PUMP B2 EXPOSURE
- TMR MTRS 70 / 40 MPa 20mm PUMP B2 EXPOSURE TREMIE B2 EXPOSURE
- TMR MTRS 70 / 50 MPa 20mm TREMIE C1 EXPOSURE

Table No. 15 and 1637

- LEAN MIX 20:1
- NO FINES 6:1
- POST TENSIONED 40 MPa 22@3
- POST TENSIONED 40 MPa 22@4
- SHOTCRETE 32 MPa

Table No. 17 and 1838

- ASPIRE® 40 GP_a – 65 MPa
- ASPIRE® 45 GP_a – 80 MPa
- ASPIRE® 50 GP_a – 100 MPa

Cradle-to-gate GWP summary (kg CO₂ eq / m³)

Brisbane region

ENVISIA® 20 MPa	ENVISIA® 25 MPa	ENVISIA® 32 MPa	ENVISIA® 40 MPa	ENVISIA® 50 MPa	
174	196	217	259	320	
ENVIROCRETE® PLUS 20 MPa	ENVIROCRETE® PLUS 25 MPa	ENVIROCRETE® PLUS 32 MPa	ENVIROCRETE® PLUS 40 MPa	ENVIROCRETE® PLUS 50 MPa	
179	191	215	256	326	
ENVIROCRETE® 20 MPa	ENVIROCRETE® 25 MPa	ENVIROCRETE® 32 MPa	ENVIROCRETE® 40 MPa	ENVIROCRETE® 50 MPa	
185	206	228	280	341	
NORMAL GP BLEND 20 MPa	NORMAL GP BLEND 25 MPa	NORMAL GP BLEND 32 MPa	NORMAL GP BLEND 40 MPa	NORMAL GP BLEND 50 MPa	
287	324	346	415	538	
NORMAL GP / FA BLEND 20 MPa	NORMAL GP / FA BLEND 25 MPa	NORMAL GP / FA BLEND 32 MPa	NORMAL GP / FA BLEND 40 MPa	NORMAL GP / FA BLEND 50 MPa	
225	252	267	335	435	
HIGH SLUMP 40 MPa	HIGH SLUMP 50 MPa	HIGH SLUMP 65 MPa	HIGH SLUMP 80 MPa		
317	351	362	559		
STABILISED SAND 10:1	KERB MACHINE 280kg	KERB MACHINE 320kg	TMR MTRS 70 / 40 MPa 20mm PUMP B2 EXPOSURE	TMR MTRS 70 / 40 MPa 20mm PUMP B2 EXPOSURE TREMIE B2 EXPOSURE	TMR MTRS 70 / 50 MPa 20mm TREMIE C1 EXPOSURE
127	257	296	387	388	356
LEAN MIX 20:1	NO FINES 6:1	POST TENSIONED 40 MPa 22@3	POST TENSIONED 40 MPa 22@4	SHOTCRETE 32 MPa	
92	252	372	355	351	
ASPIRE® 40 GPa – 65 MPa	ASPIRE® 45 GPa – 80 MPa	ASPIRE® 50 GPa – 100 MPa			
415	457	508			

Brisbane region

TABLE 1. ENVIRONMENTAL PROFILES (A1-A3), LOWER CARBON CONCRETE, BRISBANE (QLD), PER M³

Indicator	Unit	ENVISIA® 20 MPa	ENVISIA® 25 MPa	ENVISIA® 32 MPa	ENVISIA® 40 MPa	ENVISIA® 50 MPa
GWP	kg CO₂ eq	174	196	217	259	320
ODP	kg CFC11 eq	5.81E-06	6.25E-06	6.64E-06	7.45E-06	8.62E-06
AP	kg SO ₂ eq	0.933	1.05	1.16	1.39	1.71
EP	kg PO ₄ ³⁻ eq	0.120	0.133	0.146	0.171	0.208
POCP	kg C ₂ H ₄ eq	0.0613	0.0669	0.0724	0.0831	0.0991
ADPE	kg Sb eq	7.52E-06	8.43E-06	1.01E-05	1.20E-05	1.78E-05
ADPF	MJ _{NCV}	1560	1730	1670	2230	2750

TABLE 2. ENVIRONMENTAL PARAMETERS (A1-A3), LOWER CARBON CONCRETE, BRISBANE (QLD), PER M³

Parameter	Unit	ENVISIA® 20 MPa	ENVISIA® 25 MPa	ENVISIA® 32 MPa	ENVISIA® 40 MPa	ENVISIA® 50 MPa
PERE	MJ _{NCV}	2.18E+01	2.44E+01	2.75E+01	3.29E+01	4.37E+01
PERM	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ _{NCV}	2.18E+01	2.44E+01	2.75E+01	3.29E+01	4.37E+01
PENRE	MJ _{NCV}	1.61E+03	1.78E+03	1.95E+03	2.29E+03	2.82E+03
PENRM	MJ _{NCV}	6.57E+00	7.38E+00	8.98E+00	1.08E+01	2.35E+01
PENRT	MJ _{NCV}	1.61E+03	1.79E+03	1.96E+03	2.30E+03	2.84E+03
SM	kg	1.56E+02	1.79E+02	2.03E+02	2.50E+02	3.12E+02
RSF	MJ _{NCV}	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
FW	m ³	3.51E+00	3.54E+00	3.51E+00	3.53E+00	3.63E+00
HWD	kg	1.17E-05	1.31E-05	1.60E-05	1.93E-05	3.54E-05
NHWD	kg	1.57E+00	1.77E+00	2.13E+00	2.56E+00	3.43E+00
RWD	kg	2.30E-03	2.60E-03	3.16E-03	3.81E-03	6.78E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Brisbane region

TABLE 3. ENVIRONMENTAL PROFILES (A1-A3), LOWER CARBON CONCRETE, BRISBANE (QLD), PER M³

Indicator	Unit	ENVIROCRETE® PLUS 20 MPa	ENVIROCRETE® PLUS 25 MPa	ENVIROCRETE® PLUS 32 MPa	ENVIROCRETE® PLUS 40 MPa	ENVIROCRETE® PLUS 50 MPa
GWP	kg CO ₂ eq	179	191	215	256	326
ODP	kg CFC11 eq	5.63E-06	5.85E-06	6.30E-06	7.06E-06	8.30E-06
AP	kg SO ₂ eq	0.893	0.951	1.07	1.28	1.63
EP	kg PO ₄ ³⁻ eq	0.119	0.126	0.140	0.164	0.204
POCP	kg C ₂ H ₄ eq	0.0594	0.0623	0.0683	0.0782	0.0950
ADPE	kg Sb eq	7.74E-06	8.86E-06	1.04E-05	1.18E-05	1.54E-05
ADPF	MJ _{NCV}	1520	1610	1800	2100	2630

TABLE 4. ENVIRONMENTAL PARAMETERS (A1-A3), LOWER CARBON CONCRETE, BRISBANE (QLD), PER M³

Parameter	Unit	ENVIROCRETE® PLUS 20 MPa	ENVIROCRETE® PLUS 25 MPa	ENVIROCRETE® PLUS 32 MPa	ENVIROCRETE® PLUS 40 MPa	ENVIROCRETE® PLUS 50 MPa
PERE	MJ _{NCV}	2.04E+01	2.20E+01	2.50E+01	2.94E+01	3.76E+01
PERM	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ _{NCV}	2.04E+01	2.20E+01	2.50E+01	2.94E+01	3.76E+01
PENRE	MJ _{NCV}	1.57E+03	1.66E+03	1.85E+03	2.16E+03	2.69E+03
PENRM	MJ _{NCV}	7.39E+00	8.57E+00	1.02E+01	1.15E+01	1.52E+01
PENRT	MJ _{NCV}	1.57E+03	1.67E+03	1.86E+03	2.17E+03	2.71E+03
SM	kg	1.44E+02	1.55E+02	1.77E+02	2.17E+02	2.86E+02
RSF	MJ _{NCV}	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
FW	m ³	3.53E+00	3.53E+00	3.54E+00	3.60E+00	3.63E+00
HWD	kg	1.26E-05	1.46E-05	1.74E-05	1.98E-05	2.60E-05
NHWD	kg	1.58E+00	1.82E+00	2.16E+00	2.46E+00	3.22E+00
RWD	kg	2.48E-03	2.87E-03	3.42E-03	3.89E-03	5.12E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Brisbane region

TABLE 5. ENVIRONMENTAL PROFILES (A1-A3), LOWER CARBON CONCRETE, BRISBANE (QLD), PER M³

Indicator	Unit	ENVIROCRETE® 20 MPa	ENVIROCRETE® 25 MPa	ENVIROCRETE® 32 MPa	ENVIROCRETE® 40 MPa	ENVIROCRETE® 50 MPa
GWP	kg CO₂ eq	185	206	228	280	341
ODP	kg CFC11 eq	5.52E-06	5.89E-06	6.28E-06	7.17E-06	8.16E-06
AP	kg SO ₂ eq	0.876	0.974	1.08	1.32	1.61
EP	kg PO ₄ ³⁻ eq	0.119	0.131	0.144	0.173	0.207
POCP	kg C ₂ H ₄ eq	0.0584	0.0633	0.0685	0.0802	0.0939
ADPE	kg Sb eq	7.73E-06	8.86E-06	1.04E-05	1.19E-05	1.53E-05
ADPF	MJ _{NCV}	1510	1660	1830	2190	2630

TABLE 6. ENVIRONMENTAL PARAMETERS (A1-A3), LOWER CARBON CONCRETE, BRISBANE (QLD), PER M³

Parameter	Unit	ENVIROCRETE® 20 MPa	ENVIROCRETE® 25 MPa	ENVIROCRETE® 32 MPa	ENVIROCRETE® 40 MPa	ENVIROCRETE® 50 MPa
PERE	MJ _{NCV}	1.95E+01	2.17E+01	2.44E+01	2.93E+01	3.61E+01
PERM	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ _{NCV}	1.95E+01	2.17E+01	2.44E+01	2.93E+01	3.61E+01
PENRE	MJ _{NCV}	1.55E+03	1.71E+03	1.88E+03	2.25E+03	2.69E+03
PENRM	MJ _{NCV}	7.39E+00	8.57E+00	1.02E+01	1.15E+01	1.52E+01
PENRT	MJ _{NCV}	1.56E+03	1.72E+03	1.89E+03	2.26E+03	2.71E+03
SM	kg	1.27E+02	1.46E+02	1.63E+02	2.08E+02	2.60E+02
RSF	MJ _{NCV}	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
FW	m ³	3.54E+00	3.56E+00	3.56E+00	3.65E+00	3.65E+00
HWD	kg	1.26E-05	1.46E-05	1.74E-05	1.98E-05	2.60E-05
NHWD	kg	1.57E+00	1.81E+00	2.15E+00	2.45E+00	3.20E+00
RWD	kg	2.48E-03	2.87E-03	3.42E-03	3.89E-03	5.12E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Brisbane region

TABLE 7. ENVIRONMENTAL PROFILES (A1-A3), NORMAL CLASS CONCRETE, BRISBANE (QLD), PER M³

Indicator	Unit	NORMAL CLASS GP BLEND 20 MPa	NORMAL CLASS GP BLEND 25 MPa	NORMAL CLASS GP BLEND 32 MPa	NORMAL CLASS GP BLEND 40 MPa	NORMAL CLASS GP BLEND 50 MPa
GWP	kg CO ₂ eq	287	324	346	415	538
ODP	kg CFC11 eq	5.97E-06	6.42E-06	6.77E-06	7.56E-06	8.99E-06
AP	kg SO ₂ eq	1.16	1.30	1.39	1.66	2.14
EP	kg PO ₄ ³⁻ eq	0.162	0.181	0.193	0.227	0.289
POCP	kg C ₂ H ₄ eq	0.0677	0.0742	0.0786	0.0903	0.1115
ADPE	kg Sb eq	4.73E-06	5.16E-06	5.68E-06	7.11E-06	1.06E-05
ADPF	MJ _{NCV}	1940	2170	2310	2720	3470

TABLE 8. ENVIRONMENTAL PARAMETERS (A1-A3), NORMAL CLASS CONCRETE, BRISBANE (QLD), PER M³

Parameter	Unit	NORMAL CLASS GP BLEND 20 MPa	NORMAL CLASS GP BLEND 25 MPa	NORMAL CLASS GP BLEND 32 MPa	NORMAL CLASS GP BLEND 40 MPa	NORMAL CLASS GP BLEND 50 MPa
PERE	MJ _{NCV}	2.16E+01	2.41E+01	2.59E+01	3.10E+01	4.09E+01
PERM	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ _{NCV}	2.16E+01	2.41E+01	2.59E+01	3.10E+01	4.09E+01
PENRE	MJ _{NCV}	1.99E+03	2.22E+03	2.37E+03	2.78E+03	3.55E+03
PENRM	MJ _{NCV}	2.46E+00	2.75E+00	4.28E+00	5.53E+00	1.02E+01
PENRT	MJ _{NCV}	2.00E+03	2.22E+03	2.37E+03	2.79E+03	3.56E+03
SM	kg	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
NRSF	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m ³	3.69E+00	3.75E+00	3.91E+00	3.99E+00	4.16E+00
HWD	kg	5.92E-06	6.49E-06	7.72E-06	9.93E-06	1.70E-05
NHWD	kg	9.30E-01	1.02E+00	1.08E+00	1.38E+00	2.04E+00
RWD	kg	1.17E-03	1.29E-03	1.53E-03	1.97E-03	3.32E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Brisbane region

TABLE 9. ENVIRONMENTAL PROFILES (A1-A3), NORMAL CLASS CONCRETE, BRISBANE (QLD), PER M³

Indicator	Unit	NORMAL CLASS GP / FA BLEND 20 MPa	NORMAL CLASS GP / FA BLEND 25 MPa	NORMAL CLASS GP / FA BLEND 32 MPa	NORMAL CLASS GP / FA BLEND 40 MPa	NORMAL CLASS GP / FA BLEND 50 MPa
GWP	kg CO₂ eq	225	252	267	335	435
ODP	kg CFC11 eq	5.42E-06	5.75E-06	6.00E-06	6.86E-06	8.10E-06
AP	kg SO ₂ eq	0.917	1.02	1.08	1.35	1.73
EP	kg PO ₄ ³⁻ eq	0.132	0.145	0.153	0.188	0.238
POCP	kg C ₂ H ₄ eq	0.0587	0.0634	0.0665	0.0787	0.0966
ADPE	kg Sb eq	4.57E-06	4.97E-06	5.47E-06	6.89E-06	1.04E-05
ADPF	MJ _{NCV}	1590	1750	1850	2270	2890

TABLE 10. ENVIRONMENTAL PARAMETERS (A1-A3), NORMAL CLASS CONCRETE, BRISBANE (QLD), PER M³

Parameter	Unit	NORMAL CLASS GP / FA BLEND 20 MPa	NORMAL CLASS GP / FA BLEND 25 MPa	NORMAL CLASS GP / FA BLEND 32 MPa	NORMAL CLASS GP / FA BLEND 40 MPa	NORMAL CLASS GP / FA BLEND 50 MPa
PERE	MJ _{NCV}	1.75E+01	1.94E+01	2.07E+01	2.57E+01	3.41E+01
PERM	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ _{NCV}	1.75E+01	1.94E+01	2.07E+01	2.57E+01	3.41E+01
PENRE	MJ _{NCV}	1.64E+03	1.80E+03	1.90E+03	2.32E+03	2.95E+03
PENRM	MJ _{NCV}	2.46E+00	2.75E+00	4.28E+00	5.53E+00	1.02E+01
PENRT	MJ _{NCV}	1.64E+03	1.80E+03	1.91E+03	2.33E+03	2.96E+03
SM	kg	7.28E+01	7.80E+01	7.49E+01	9.67E+01	1.31E+02
RSF	MJ _{NCV}	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
FW	m ³	3.51E+00	3.54E+00	3.68E+00	3.76E+00	3.86E+00
HWD	kg	5.92E-06	6.49E-06	7.72E-06	9.93E-06	1.70E-05
NHWD	kg	9.17E-01	1.00E+00	1.06E+00	1.36E+00	2.02E+00
RWD	kg	1.17E-03	1.29E-03	1.53E-03	1.97E-03	3.32E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Brisbane region

TABLE 11. ENVIRONMENTAL PROFILES (A1-A3), CONCRETE FOR SPECIAL APPLICATIONS, BRISBANE (QLD), PER M³

Indicator	Unit	HIGH SLUMP 40 MPa	HIGH SLUMP 50 MPa	HIGH SLUMP 65 MPa	HIGH SLUMP 80 MPa
GWP	kg CO ₂ eq	317	351	362	559
ODP	kg CFC11 eq	5.06E-06	8.35E-06	7.97E-06	9.56E-06
AP	kg SO ₂ eq	1.50	1.65	1.60	2.23
EP	kg PO ₄ ³⁻ eq	0.194	0.213	0.211	0.301
POCP	kg C ₂ H ₄ eq	0.0885	0.0956	0.0926	0.119
ADPE	kg Sb eq	1.08E-05	5.28E-06	1.63E-05	2.63E-05
ADPF	MJ _{NCV}	2450	2680	2620	3680

TABLE 12. ENVIRONMENTAL PARAMETERS (A1-A3), CONCRETE FOR SPECIAL APPLICATIONS, BRISBANE (QLD), PER M³

Parameter	Unit	HIGH SLUMP 40 MPa	HIGH SLUMP 50 MPa	HIGH SLUMP 65 MPa	HIGH SLUMP 80 MPa
PERE	MJ _{NCV}	3.25E+01	3.43E+01	3.57E+01	5.24E+01
PERM	MJ _{NCV}	0.00E+00	0.00E+00	9.29E-02	2.05E-01
PERT	MJ _{NCV}	3.25E+01	3.43E+01	3.57E+01	5.26E+01
PENRE	MJ _{NCV}	2.51E+03	2.74E+03	2.69E+03	3.76E+03
PENRM	MJ _{NCV}	1.31E+01	1.47E+01	6.88E+00	1.52E+01
PENRT	MJ _{NCV}	2.53E+03	2.76E+03	2.69E+03	3.77E+03
SM	kg	2.50E+02	2.70E+02	2.38E+02	1.27E+02
RSF	MJ _{NCV}	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
FW	m ³	3.57E+00	3.66E+00	3.69E+00	4.19E+00
HWD	kg	2.01E-05	1.86E-05	2.88E-05	5.57E-05
NHWD	kg	2.05E+00	2.81E-01	3.68E+00	5.59E+00
RWD	kg	3.86E-03	3.16E-03	4.02E-03	7.04E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Brisbane region

TABLE 13. ENVIRONMENTAL PROFILES (A1-A3), CONCRETE FOR SPECIAL APPLICATIONS, BRISBANE (QLD), PER M³

Indicator	Unit	STABILISED SAND 10:1	KERB MACHINE 280kg	KERB MACHINE 320kg	TMR MTRS 70 / 40 MPa 20MM PUMP B2 EXPOSURE	TMR MTRS 70 / 40 MPa 20mm PUMP B2 EXPOSURE TREMIE B2 EXPOSURE	TMR MTRS 70 / 50 MPa 20mm TREMIE C1 EXPOSURE
GWP	kg CO ₂ eq	127	257	296	387	388	356
ODP	kg CFC11 eq	3.63E-06	5.74E-06	6.14E-06	7.56E-06	7.55E-06	7.81E-06
AP	kg SO ₂ eq	0.525	1.04	1.19	1.55	1.56	1.56
EP	kg PO ₄ ³⁻ eq	0.0785	0.147	0.166	0.214	0.214	0.206
POCP	kg C ₂ H ₄ eq	0.0369	0.0640	0.0704	0.0883	0.0891	0.0919
ADPE	kg Sb eq	7.01E-07	8.18E-06	9.50E-06	7.89E-06	1.69E-05	2.58E-05
ADPF	MJ _{NCV}	940	1790	2020	2580	2610	2640

TABLE 14. ENVIRONMENTAL PARAMETERS (A1-A3), CONCRETE FOR SPECIAL APPLICATIONS, BRISBANE (QLD), PER M³

Parameter	Unit	STABILISED SAND 10:1	KERB MACHINE 280kg	KERB MACHINE 320kg	TMR MTRS 70 / 40 MPa 20mm PUMP B2 EXPOSURE	TMR MTRS 70 / 40 MPa 20mm PUMP B2 EXPOSURE TREMIE B2 EXPOSURE	TMR MTRS 70 / 50 MPa 20mm TREMIE C1 EXPOSURE
PERE	MJ _{NCV}	9.22E+00	2.07E+01	2.37E+01	2.95E+01	3.34E+01	4.09E+01
PERM	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.35E-02	1.08E-01
PERT	MJ _{NCV}	9.22E+00	2.07E+01	2.37E+01	2.95E+01	3.34E+01	4.10E+01
PENRE	MJ _{NCV}	9.72E+02	1.83E+03	2.07E+03	2.65E+03	2.67E+03	2.70E+03
PENRM	MJ _{NCV}	0.00E+00	2.98E+00	3.52E+00	6.25E+00	4.71E+00	1.62E+01
PENRT	MJ _{NCV}	9.72E+02	1.84E+03	2.07E+03	2.65E+03	2.68E+03	2.71E+03
SM	kg	3.64E+01	7.28E+01	8.63E+01	1.14E+02	1.14E+02	2.34E+02
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	2.81E+00	3.56E+00	3.48E+00	3.78E+00	3.86E+00	3.58E+00
HWD	kg	0.00E+00	9.62E-06	1.12E-05	1.13E-05	2.46E-05	4.73E-05
NHWD	kg	7.68E-02	1.91E+00	2.23E+00	1.57E+00	4.04E+00	5.81E+00
RWD	kg	0.00E+00	2.01E-03	2.36E-03	2.25E-03	3.90E-03	7.39E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
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

Brisbane region

TABLE 15. ENVIRONMENTAL PROFILES (A1-A3), CONCRETE FOR SPECIAL APPLICATIONS, BRISBANE (QLD), PER M³

Indicator	Unit	LEAN MIX 20:1	NO FINES 6:1	POST TENSIONED 40 MPa 22@3	POST TENSIONED 40 MPa 22@4	SHOTCRETE 32 MPa
GWP	kg CO₂ eq	92	252	372	355	351
ODP	kg CFC11 eq	3.93E-06	5.40E-06	7.35E-06	7.16E-06	6.86E-06
AP	kg SO ₂ eq	0.396	1.02	1.49	1.42	1.41
EP	kg PO ₄ ³⁻ eq	0.0654	0.143	0.206	0.198	0.194
POCP	kg C ₂ H ₄ eq	0.0361	0.0603	0.0854	0.0825	0.0801
ADPE	kg Sb eq	8.59E-07	1.21E-06	8.14E-06	6.68E-06	6.81E-06
ADPF	MJ _{NCV}	790	1710	2490	2390	2340

TABLE 16. ENVIRONMENTAL PARAMETERS (A1-A3), CONCRETE FOR SPECIAL APPLICATIONS, BRISBANE (QLD), PER M³

Parameter	Unit	LEAN MIX 20:1	NO FINES 6:1	POST TENSIONED 40 MPa 22@3	POST TENSIONED 40 MPa 22@4	SHOTCRETE 32 MPa
PERE	MJ _{NCV}	7.19E+00	1.76E+01	2.87E+01	2.70E+01	2.64E+01
PERM	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ _{NCV}	7.19E+00	1.76E+01	2.87E+01	2.70E+01	2.64E+01
PENRE	MJ _{NCV}	8.26E+02	1.75E+03	2.55E+03	2.45E+03	2.40E+03
PENRM	MJ _{NCV}	0.00E+00	0.00E+00	7.16E+00	6.23E+00	4.26E+00
PENRT	MJ _{NCV}	8.26E+02	1.75E+03	2.56E+03	2.45E+03	2.40E+03
SM	kg	1.77E+01	0.00E+00	1.09E+02	1.04E+02	1.04E+02
RSF	MJ _{NCV}	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
FW	m ³	3.45E+00	2.97E+00	3.81E+00	3.80E+00	3.65E+00
HWD	kg	0.00E+00	0.00E+00	1.24E-05	1.03E-05	8.78E-06
NHWD	kg	8.24E-02	1.12E-01	1.59E+00	1.24E+00	1.42E+00
RWD	kg	0.00E+00	0.00E+00	2.44E-03	2.00E-03	1.78E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Brisbane region

TABLE 17. ENVIRONMENTAL PROFILES (A1-A3), CONCRETE FOR SPECIAL APPLICATIONS, BRISBANE (QLD), PER M³

Indicator	Unit	ASPIRE® 40 GPa – 65 MPa	ASPIRE® 45 GPa – 80 MPa	ASPIRE® 50 GPa – 100 MPa
GWP	kg CO₂ eq	415	457	508
ODP	kg CFC11 eq	9.72E-06	1.11E-05	1.41E-05
AP	kg SO ₂ eq	1.88	2.07	2.41
EP	kg PO ₄ ³⁻ eq	0.242	0.266	0.306
POCP	kg C ₂ H ₄ eq	0.115	0.131	0.164
ADPE	kg Sb eq	2.83E-05	3.04E-05	4.48E-05
ADPF	MJ _{NCV}	3210	3580	4300

TABLE 18. ENVIRONMENTAL PARAMETERS (A1-A3), CONCRETE FOR SPECIAL APPLICATIONS, BRISBANE (QLD), PER M³

Parameter	Unit	ASPIRE® 40 GPa – 65 MPa	ASPIRE® 45 GPa – 80 MPa	ASPIRE® 50 GPa – 100 MPa
PERE	MJ _{NCV}	7.94E+01	9.81E+01	1.45E+02
PERM	MJ _{NCV}	2.12E-01	2.17E-01	3.99E-01
PERT	MJ _{NCV}	7.96E+01	9.83E+01	1.45E+02
PENRE	MJ _{NCV}	3.27E+03	3.63E+03	4.35E+03
PENRM	MJ _{NCV}	2.39E+01	2.66E+01	4.23E+01
PENRT	MJ _{NCV}	3.29E+03	3.66E+03	4.39E+03
SM	kg	1.61E+02	1.72E+02	2.70E+02
RSF	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00
FW	m ³	1.65E+01	2.31E+01	3.63E+01
HWD	kg	6.60E-05	7.06E-05	1.15E-04
NHWD	kg	5.71E+00	6.08E+00	8.65E+00
RWD	kg	8.72E-03	9.49E-03	1.44E-02
CRU	kg	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01
MER	kg	0.00E+00	0.00E+00	0.00E+00
EE	MJ	0.00E+00	0.00E+00	0.00E+00



Brisbane South and Gold Coast region

Environmental profiles and parameters

Product table list

Brisbane South and Gold Coast region

In each region, we start with presenting a summary of the carbon footprint (GWP summary) of our concrete mixes.

Lower carbon concrete products

Table No. 1 and 242

- ENVISIA® 20 MPa
- ENVISIA® 25 MPa
- ENVISIA® 32 MPa
- ENVISIA® 40 MPa
- ENVISIA® 50 MPa

Table No. 3 and 443

- ENVIROCRETE® PLUS 20 MPa
- ENVIROCRETE® PLUS 25 MPa
- ENVIROCRETE® PLUS 32 MPa
- ENVIROCRETE® PLUS 40 MPa
- ENVIROCRETE® PLUS 50 MPa

Table No. 5 and 644

- ENVIROCRETE® 20 MPa
- ENVIROCRETE® 25 MPa
- ENVIROCRETE® 32 MPa
- ENVIROCRETE® 40 MPa
- ENVIROCRETE® 50 MPa

Normal class concrete products

Table No. 7 and 845

- NORMAL CLASS GP BLEND 20 MPa
- NORMAL CLASS GP BLEND 25 MPa
- NORMAL CLASS GP BLEND 32 MPa
- NORMAL CLASS GP BLEND 40 MPa
- NORMAL CLASS GP BLEND 50 MPa

Table No. 9 and 1046

- NORMAL CLASS GP / FA BLEND 20 MPa
- NORMAL CLASS GP / FA BLEND 25 MPa
- NORMAL CLASS GP / FA BLEND 32 MPa
- NORMAL CLASS GP / FA BLEND 40 MPa
- NORMAL CLASS GP / FA BLEND 50 MPa

Concrete for special applications

Table No. 11 and 1247

- HIGH SLUMP 40 MPa
- HIGH SLUMP 50 MPa
- HIGH SLUMP 65 MPa
- HIGH SLUMP 80 MPa

Table No. 13 and 1448

- STABILISED SAND 12:1
- KERB MACHINE 280kg
- KERB MACHINE 320kg
- TMR MTRS 70 / 40 MPa 20mm PUMP B2 EXPOSURE
- TMR MTRS 70 / 40 MPa 20mm PUMP B2 EXPOSURE TREMIE B2 EXPOSURE
- TMR MTRS 70 / 50 MPa 20mm TREMIE C1 EXPOSURE

Table No. 15 and 1649

- LEAN MIX 20:1
- NO FINES 6:1
- POST TENSIONED 40 MPa 22@3
- POST TENSIONED 40 MPa 22@4
- SHOTCRETE 32 MPa

Table No. 17 and 1850

- ASPIRE® 40 GPa – 65 MPa
- ASPIRE® 45 GPa – 80 MPa
- ASPIRE® 50 GPa – 100 MPa

Cradle-to-gate GWP summary (kg CO₂ eq / m³)

Brisbane South and Gold Coast region

ENVISIA® 20 MPa	ENVISIA® 25 MPa	ENVISIA® 32 MPa	ENVISIA® 40 MPa	ENVISIA® 50 MPa	
168	184	201	256	311	
ENVIROCRETE® PLUS 20 MPa	ENVIROCRETE® PLUS 25 MPa	ENVIROCRETE® PLUS 32 MPa	ENVIROCRETE® PLUS 40 MPa	ENVIROCRETE® PLUS 50 MPa	
173	192	213	253	310	
ENVIROCRETE® 20 MPa	ENVIROCRETE® 25 MPa	ENVIROCRETE® 32 MPa	ENVIROCRETE® 40 MPa	ENVIROCRETE® 50 MPa	
179	199	221	263	321	
NORMAL GP BLEND 20 MPa	NORMAL GP BLEND 25 MPa	NORMAL GP BLEND 32 MPa	NORMAL GP BLEND 40 MPa	NORMAL GP BLEND 50 MPa	
294	326	379	453	533	
NORMAL GP / FA BLEND 20 MPa	NORMAL GP / FA BLEND 25 MPa	NORMAL GP / FA BLEND 32 MPa	NORMAL GP / FA BLEND 40 MPa	NORMAL GP / FA BLEND 50 MPa	
222	249	279	339	407	
HIGH SLUMP 40 MPa	HIGH SLUMP 50 MPa	HIGH SLUMP 65 MPa	HIGH SLUMP 80 MPa		
313	407	492	519		
STABILISED SAND 12:1	KERB MACHINE 280kg	KERB MACHINE 320kg	TMR MTRS 70 / 40 MPa 20mm PUMP B2 EXPOSURE TREMIE B2 EXPOSURE	TMR MTRS 70 / 40 MPa 20mm PUMP B2 EXPOSURE	TMR MTRS 70 / 50 MPa 20mm TREMIE C1 EXPOSURE
175	255	295	378	373	351
LEAN MIX 20:1	NO FINES 6:1	POST TENSIONED 40 MPa 22@3	POST TENSIONED 40 MPa 22@4	SHOTCRETE 32 MPa	
112	266	358	350	374	
ASPIRE® 40 GPa – 65 MPa	ASPIRE® 45 GPa – 80 MPa	ASPIRE® 50 GPa – 100 MPa			
420	461	512			

Brisbane South and Gold Coast region

TABLE 1. ENVIRONMENTAL PROFILES (A1-A3), LOWER CARBON CONCRETE, BRISBANE SOUTH AND GOLD COAST (QLD), PER M³

Indicator	Unit	ENVISIA® 20 MPa	ENVISIA® 25 MPa	ENVISIA® 32 MPa	ENVISIA® 40 MPa	ENVISIA® 50 MPa
GWP	kg CO₂ eq	168	184	201	256	311
ODP	kg CFC11 eq	5.47E-06	5.81E-06	6.18E-06	7.24E-06	8.21E-06
AP	kg SO ₂ eq	0.899	0.990	1.08	1.37	1.66
EP	kg PO ₄ ³⁻ eq	0.113	0.123	0.134	0.167	0.199
POCP	kg C ₂ H ₄ eq	0.0583	0.0626	0.0672	0.0816	0.0948
ADPE	kg Sb eq	3.70E-06	4.08E-06	4.42E-06	1.05E-05	1.01E-05
ADPF	MJ _{NCV}	1470	1600	1730	2200	2630

TABLE 2. ENVIRONMENTAL PARAMETERS (A1-A3), LOWER CARBON CONCRETE, BRISBANE SOUTH AND GOLD COAST (QLD), PER M³

Parameter	Unit	ENVISIA® 20 MPa	ENVISIA® 25 MPa	ENVISIA® 32 MPa	ENVISIA® 40 MPa	ENVISIA® 50 MPa
PERE	MJ _{NCV}	1.95E+01	2.14E+01	2.32E+01	3.28E+01	3.95E+01
PERM	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ _{NCV}	1.95E+01	2.14E+01	2.32E+01	3.28E+01	3.95E+01
PENRE	MJ _{NCV}	1.52E+03	1.65E+03	1.79E+03	2.26E+03	2.70E+03
PENRM	MJ _{NCV}	3.41E+00	3.82E+00	4.23E+00	1.44E+01	1.87E+01
PENRT	MJ _{NCV}	1.52E+03	1.66E+03	1.79E+03	2.27E+03	2.72E+03
SM	kg	1.56E+02	1.75E+02	1.93E+02	2.50E+02	3.12E+02
RSF	MJ _{NCV}	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
FW	m ³	3.29E+00	3.30E+00	3.35E+00	3.45E+00	3.44E+00
HWD	kg	6.00E-06	6.66E-06	6.88E-06	2.12E-05	2.43E-05
NHWD	kg	7.16E-01	7.95E-01	8.73E-01	1.97E+00	1.60E+00
RWD	kg	1.15E-03	1.27E-03	1.34E-03	4.03E-03	4.49E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Brisbane South and Gold Coast region

TABLE 3. ENVIRONMENTAL PROFILES (A1-A3), LOWER CARBON CONCRETE, BRISBANE SOUTH AND GOLD COAST (QLD), PER M³

Indicator	Unit	ENVIROCRETE® PLUS 20 MPa	ENVIROCRETE® PLUS 25 MPa	ENVIROCRETE® PLUS 32 MPa	ENVIROCRETE® PLUS 40 MPa	ENVIROCRETE® PLUS 50 MPa
GWP	kg CO₂ eq	173	192	213	253	310
ODP	kg CFC11 eq	5.34E-06	5.70E-06	6.09E-06	6.84E-06	7.73E-06
AP	kg SO ₂ eq	0.861	0.960	1.06	1.27	1.54
EP	kg PO ₄ ³⁻ eq	0.112	0.124	0.136	0.159	0.191
POCP	kg C ₂ H ₄ eq	0.0571	0.0619	0.0670	0.0770	0.0897
ADPE	kg Sb eq	7.96E-06	9.43E-06	1.02E-05	1.29E-05	1.76E-05
ADPF	MJ _{NCV}	1450	1600	1750	2060	2490

TABLE 4. ENVIRONMENTAL PARAMETERS (A1-A3), LOWER CARBON CONCRETE, BRISBANE SOUTH AND GOLD COAST (QLD), PER M³

Parameter	Unit	ENVIROCRETE® PLUS 20 MPa	ENVIROCRETE® PLUS 25 MPa	ENVIROCRETE® PLUS 32 MPa	ENVIROCRETE® PLUS 40 MPa	ENVIROCRETE® PLUS 50 MPa
PERE	MJ _{NCV}	1.93E+01	2.17E+01	2.39E+01	2.89E+01	3.69E+01
PERM	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ _{NCV}	1.93E+01	2.17E+01	2.39E+01	2.89E+01	3.69E+01
PENRE	MJ _{NCV}	1.50E+03	1.65E+03	1.80E+03	2.12E+03	2.56E+03
PENRM	MJ _{NCV}	4.92E+00	5.90E+00	6.39E+00	9.09E+00	1.49E+01
PENRT	MJ _{NCV}	1.50E+03	1.65E+03	1.81E+03	2.13E+03	2.57E+03
SM	kg	1.39E+02	1.60E+02	1.80E+02	2.20E+02	2.75E+02
RSF	MJ _{NCV}	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
FW	m ³	3.34E+00	3.35E+00	3.38E+00	3.42E+00	3.47E+00
HWD	kg	1.09E-05	1.31E-05	1.42E-05	1.90E-05	2.82E-05
NHWD	kg	1.84E+00	2.19E+00	2.37E+00	2.97E+00	3.93E+00
RWD	kg	2.24E-03	2.69E-03	2.91E-03	3.85E-03	5.64E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Brisbane South and Gold Coast region

TABLE 5. ENVIRONMENTAL PROFILES (A1-A3), LOWER CARBON CONCRETE, BRISBANE SOUTH AND GOLD COAST (QLD), PER M³

Indicator	Unit	ENVIROCRETE® 20 MPa	ENVIROCRETE® 25 MPa	ENVIROCRETE® 32 MPa	ENVIROCRETE® 40 MPa	ENVIROCRETE® 50 MPa
GWP	kg CO₂ eq	179	199	221	263	321
ODP	kg CFC11 eq	5.28E-06	5.63E-06	6.02E-06	6.75E-06	7.61E-06
AP	kg SO ₂ eq	0.845	0.941	1.04	1.24	1.51
EP	kg PO ₄ ³⁻ eq	0.113	0.125	0.137	0.161	0.193
POCP	kg C ₂ H ₄ eq	0.0561	0.0608	0.0658	0.0754	0.0877
ADPE	kg Sb eq	3.75E-06	4.39E-06	4.74E-06	6.03E-06	8.31E-06
ADPF	MJ _{NCV}	1430	1570	1730	2030	2450

TABLE 6. ENVIRONMENTAL PARAMETERS (A1-A3), LOWER CARBON CONCRETE, BRISBANE SOUTH AND GOLD COAST (QLD), PER M³

Parameter	Unit	ENVIROCRETE® 20 MPa	ENVIROCRETE® 25 MPa	ENVIROCRETE® 32 MPa	ENVIROCRETE® 40 MPa	ENVIROCRETE® 50 MPa
PERE	MJ _{NCV}	1.70E+01	1.90E+01	2.09E+01	2.51E+01	3.18E+01
PERM	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ _{NCV}	1.70E+01	1.90E+01	2.09E+01	2.51E+01	3.18E+01
PENRE	MJ _{NCV}	1.47E+03	1.62E+03	1.78E+03	2.08E+03	2.51E+03
PENRM	MJ _{NCV}	4.10E+00	4.92E+00	5.33E+00	7.57E+00	1.24E+01
PENRT	MJ _{NCV}	1.48E+03	1.63E+03	1.78E+03	2.09E+03	2.52E+03
SM	kg	1.27E+02	1.46E+02	1.63E+02	2.01E+02	2.50E+02
RSF	MJ _{NCV}	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
FW	m ³	3.35E+00	3.36E+00	3.40E+00	3.44E+00	3.48E+00
HWD	kg	6.28E-06	7.53E-06	8.16E-06	1.12E-05	1.74E-05
NHWD	kg	6.92E-01	8.16E-01	8.82E-01	1.10E+00	1.44E+00
RWD	kg	1.21E-03	1.45E-03	1.57E-03	2.13E-03	3.27E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Brisbane South and Gold Coast region

TABLE 7. ENVIRONMENTAL PROFILES (A1-A3), NORMAL CLASS CONCRETE, BRISBANE SOUTH AND GOLD COAST (QLD), PER M³

Indicator	Unit	NORMAL CLASS GP BLEND 20 MPa	NORMAL CLASS GP BLEND 25 MPa	NORMAL CLASS GP BLEND 32 MPa	NORMAL CLASS GP BLEND 40 MPa	NORMAL CLASS GP BLEND 50 MPa
GWP	kg CO₂ eq	294	326	379	453	533
ODP	kg CFC11 eq	5.92E-06	6.31E-06	7.02E-06	7.94E-06	8.78E-06
AP	kg SO ₂ eq	1.18	1.30	1.51	1.80	2.11
EP	kg PO ₄ ³⁻ eq	0.163	0.179	0.206	0.244	0.284
POCP	kg C ₂ H ₄ eq	0.0684	0.0740	0.0836	0.0967	0.110
ADPE	kg Sb eq	3.91E-06	4.32E-06	4.73E-06	5.75E-06	8.33E-06
ADPF	MJ _{NCV}	1970	2160	2480	2930	3420

TABLE 8. ENVIRONMENTAL PARAMETERS (A1-A3), NORMAL CLASS CONCRETE, BRISBANE SOUTH AND GOLD COAST (QLD), PER M³

Parameter	Unit	NORMAL CLASS GP BLEND 20 MPa	NORMAL CLASS GP BLEND 25 MPa	NORMAL CLASS GP BLEND 32 MPa	NORMAL CLASS GP BLEND 40 MPa	NORMAL CLASS GP BLEND 50 MPa
PERE	MJ _{NCV}	2.18E+01	2.40E+01	2.75E+01	3.27E+01	3.98E+01
PERM	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ _{NCV}	2.18E+01	2.40E+01	2.75E+01	3.27E+01	3.98E+01
PENRE	MJ _{NCV}	2.02E+03	2.21E+03	2.54E+03	3.00E+03	3.49E+03
PENRM	MJ _{NCV}	3.41E+00	3.82E+00	4.23E+00	5.26E+00	1.01E+01
PENRT	MJ _{NCV}	2.02E+03	2.22E+03	2.55E+03	3.00E+03	3.50E+03
SM	kg	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
NRSF	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m ³	3.62E+00	3.67E+00	3.82E+00	3.94E+00	4.04E+00
HWD	kg	6.00E-06	6.66E-06	6.88E-06	8.54E-06	1.49E-05
NHWD	kg	6.91E-01	7.67E-01	8.46E-01	1.04E+00	1.45E+00
RWD	kg	1.15E-03	1.27E-03	1.34E-03	1.66E-03	2.85E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Brisbane South and Gold Coast region

TABLE 9. ENVIRONMENTAL PROFILES (A1-A3), NORMAL CLASS CONCRETE, BRISBANE SOUTH AND GOLD COAST (QLD), PER M³

Indicator	Unit	NORMAL CLASS GP / FA BLEND 20 MPa	NORMAL CLASS GP / FA BLEND 25 MPa	NORMAL CLASS GP / FA BLEND 32 MPa	NORMAL CLASS GP / FA BLEND 40 MPa	NORMAL CLASS GP / FA BLEND 50 MPa
GWP	kg CO₂ eq	222	249	279	339	407
ODP	kg CFC11 eq	5.25E-06	5.60E-06	6.01E-06	6.81E-06	7.54E-06
AP	kg SO ₂ eq	0.897	1.00	1.12	1.36	1.62
EP	kg PO ₄ ³⁻ eq	0.127	0.141	0.156	0.187	0.220
POCP	kg C ₂ H ₄ eq	0.0576	0.0624	0.0679	0.0790	0.0903
ADPE	kg Sb eq	3.72E-06	4.11E-06	4.47E-06	5.44E-06	7.99E-06
ADPF	MJ _{NCV}	1560	1720	1900	2270	2690

TABLE 10. ENVIRONMENTAL PARAMETERS (A1-A3), NORMAL CLASS CONCRETE, BRISBANE SOUTH AND GOLD COAST (QLD), PER M³

Parameter	Unit	NORMAL CLASS GP / FA BLEND 20 MPa	NORMAL CLASS GP / FA BLEND 25 MPa	NORMAL CLASS GP / FA BLEND 32 MPa	NORMAL CLASS GP / FA BLEND 40 MPa	NORMAL CLASS GP / FA BLEND 50 MPa
PERE	MJ _{NCV}	1.71E+01	1.90E+01	2.09E+01	2.52E+01	3.15E+01
PERM	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ _{NCV}	1.71E+01	1.90E+01	2.09E+01	2.52E+01	3.15E+01
PENRE	MJ _{NCV}	1.60E+03	1.77E+03	1.95E+03	2.32E+03	2.75E+03
PENRM	MJ _{NCV}	3.41E+00	3.82E+00	4.23E+00	5.26E+00	1.01E+01
PENRT	MJ _{NCV}	1.60E+03	1.77E+03	1.95E+03	2.33E+03	2.76E+03
SM	kg	7.28E+01	7.80E+01	8.01E+01	9.98E+01	1.12E+02
RSF	MJ _{NCV}	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
FW	m ³	3.41E+00	3.45E+00	3.53E+00	3.61E+00	3.67E+00
HWD	kg	6.00E-06	6.66E-06	6.88E-06	8.54E-06	1.49E-05
NHWD	kg	6.76E-01	7.51E-01	8.25E-01	1.01E+00	1.43E+00
RWD	kg	1.15E-03	1.27E-03	1.34E-03	1.66E-03	2.85E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Brisbane South and Gold Coast region

TABLE 11. ENVIRONMENTAL PROFILES (A1-A3), CONCRETE FOR SPECIAL APPLICATIONS, BRISBANE SOUTH AND GOLD COAST (QLD), PER M³

Indicator	Unit	HIGH SLUMP 40 MPa	HIGH SLUMP 50 MPa	HIGH SLUMP 65 MPa	HIGH SLUMP 80 MPa
GWP	kg CO ₂ eq	313	407	492	519
ODP	kg CFC11 eq	7.67E-06	7.53E-06	8.56E-06	8.93E-06
AP	kg SO ₂ eq	1.49	1.62	1.96	2.06
EP	kg PO ₄ ³⁻ eq	0.190	0.221	0.263	0.277
POCP	kg C ₂ H ₄ eq	0.0878	0.0905	0.106	0.111
ADPE	kg Sb eq	1.06E-05	9.75E-06	1.49E-05	1.94E-05
ADPF	MJ _{NCV}	2420	2700	3210	3390

TABLE 12. ENVIRONMENTAL PARAMETERS (A1-A3), CONCRETE FOR SPECIAL APPLICATIONS, BRISBANE SOUTH AND GOLD COAST (QLD), PER M³

Parameter	Unit	HIGH SLUMP 40 MPa	HIGH SLUMP 50 MPa	HIGH SLUMP 65 MPa	HIGH SLUMP 80 MPa
PERE	MJ _{NCV}	3.20E+01	3.24E+01	4.17E+01	4.52E+01
PERM	MJ _{NCV}	0.00E+00	0.00E+00	1.30E-01	1.37E-01
PERT	MJ _{NCV}	3.20E+01	3.24E+01	4.19E+01	4.53E+01
PENRE	MJ _{NCV}	2.48E+03	2.76E+03	3.28E+03	3.46E+03
PENRM	MJ _{NCV}	1.31E+01	1.13E+01	9.63E+00	1.02E+01
PENRT	MJ _{NCV}	2.49E+03	2.77E+03	3.29E+03	3.47E+03
SM	kg	2.50E+02	1.12E+02	1.12E+02	1.19E+02
RSF	MJ _{NCV}	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
FW	m ³	3.56E+00	3.68E+00	3.84E+00	3.95E+00
HWD	kg	2.01E-05	1.77E-05	3.34E-05	3.87E-05
NHWD	kg	2.03E+00	1.85E+00	3.01E+00	4.21E+00
RWD	kg	3.86E-03	3.41E-03	4.03E-03	5.05E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Brisbane South and Gold Coast region

TABLE 13. ENVIRONMENTAL PROFILES (A1-A3), CONCRETE FOR SPECIAL APPLICATIONS, BRISBANE SOUTH AND GOLD COAST (QLD), PER M³

Indicator	Unit	STABILISED SAND 12:1	KERB MACHINE 280kg	KERB MACHINE 320kg	TMR MTRS 70 / 40 MPa 20mm PUMP B2 EXPOSURE TREMIE B2 EXPOSURE	TMR MTRS 70 / 40 MPa 20mm PUMP B2 EXPOSURE	TMR MTRS 70 / 50 MPa 20mm TREMIE C1 EXPOSURE
GWP	kg CO₂ eq	175	255	295	378	373	351
ODP	kg CFC11 eq	3.83E-06	5.75E-06	6.30E-06	7.27E-06	7.32E-06	7.79E-06
AP	kg SO ₂ eq	0.703	1.03	1.18	1.52	1.49	1.55
EP	kg PO ₄ ³⁻ eq	0.0988	0.144	0.165	0.206	0.204	0.203
POCP	kg C ₂ H ₄ eq	0.0425	0.0640	0.0715	0.0868	0.0859	0.0915
ADPE	kg Sb eq	6.14E-07	4.15E-06	4.81E-06	1.72E-05	7.02E-06	2.45E-05
ADPF	MJ _{NCV}	1200	1760	2010	2540	2490	2580

TABLE 14. ENVIRONMENTAL PARAMETERS (A1-A3), CONCRETE FOR SPECIAL APPLICATIONS, BRISBANE SOUTH AND GOLD COAST (QLD), PER M³

Parameter	Unit	STABILISED SAND 12:1	KERB MACHINE 280kg	KERB MACHINE 320kg	TMR MTRS 70 / 40 MPa 20mm PUMP B2 EXPOSURE TREMIE B2 EXPOSURE	TMR MTRS 70 / 40 MPa 20mm PUMP B2 EXPOSURE	TMR MTRS 70 / 50 MPa 20mm TREMIE C1 EXPOSURE
PERE	MJ _{NCV}	1.26E+01	1.94E+01	2.23E+01	3.35E+01	2.86E+01	3.97E+01
PERM	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00	8.79E-02	0.00E+00	1.53E-01
PERT	MJ _{NCV}	1.26E+01	1.94E+01	2.23E+01	3.36E+01	2.86E+01	3.99E+01
PENRE	MJ _{NCV}	1.23E+03	1.81E+03	2.06E+03	2.60E+03	2.55E+03	2.65E+03
PENRM	MJ _{NCV}	0.00E+00	3.82E+00	4.51E+00	6.52E+00	9.34E+00	1.13E+01
PENRT	MJ _{NCV}	1.23E+03	1.81E+03	2.06E+03	2.60E+03	2.56E+03	2.66E+03
SM	kg	0.00E+00	7.28E+01	8.63E+01	1.11E+02	1.42E+02	2.34E+02
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	2.64E+00	3.54E+00	3.62E+00	3.67E+00	3.59E+00	3.78E+00
HWD	kg	0.00E+00	6.73E-06	7.84E-06	2.90E-05	1.35E-05	4.63E-05
NHWD	kg	6.91E-02	7.53E-01	8.79E-01	4.00E+00	1.20E+00	5.65E+00
RWD	kg	0.00E+00	1.28E-03	1.50E-03	4.23E-03	2.55E-03	6.39E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
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

Brisbane South and Gold Coast region

TABLE 15. ENVIRONMENTAL PROFILES (A1-A3), CONCRETE FOR SPECIAL APPLICATIONS, BRISBANE SOUTH AND GOLD COAST (QLD), PER M³

Indicator	Unit	LEAN MIX 20:1	NO FINES 6:1	POST TENSIONED 40 MPa 22@3	POST TENSIONED 40 MPa 22@4	SHOTCRETE 32 MPa
GWP	kg CO ₂ eq	112	266	358	350	374
ODP	kg CFC11 eq	4.09E-06	5.22E-06	6.95E-06	6.85E-06	7.19E-06
AP	kg SO ₂ eq	0.469	1.07	1.43	1.40	1.49
EP	kg PO ₄ ³⁻ eq	0.0728	0.147	0.196	0.192	0.204
POCP	kg C ₂ H ₄ eq	0.0394	0.0606	0.0817	0.0801	0.0847
ADPE	kg Sb eq	6.53E-07	9.66E-07	5.72E-06	5.59E-06	4.41E-06
ADPF	MJ _{NCV}	900	1750	2380	2330	2470

TABLE 16. ENVIRONMENTAL PARAMETERS (A1-A3), CONCRETE FOR SPECIAL APPLICATIONS, BRISBANE SOUTH AND GOLD COAST (QLD), PER M³

Parameter	Unit	LEAN MIX 20:1	NO FINES 6:1	POST TENSIONED 40 MPa 22@3	POST TENSIONED 40 MPa 22@4	SHOTCRETE 32 MPa
PERE	MJ _{NCV}	8.35E+00	1.79E+01	2.68E+01	2.62E+01	2.71E+01
PERM	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ _{NCV}	8.35E+00	1.79E+01	2.68E+01	2.62E+01	2.71E+01
PENRE	MJ _{NCV}	9.33E+02	1.80E+03	2.44E+03	2.39E+03	2.53E+03
PENRM	MJ _{NCV}	0.00E+00	0.00E+00	5.60E+00	5.46E+00	4.72E+00
PENRT	MJ _{NCV}	9.33E+02	1.80E+03	2.44E+03	2.39E+03	2.53E+03
SM	kg	2.60E+01	0.00E+00	1.07E+02	1.04E+02	1.12E+02
RSF	MJ _{NCV}	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
FW	m ³	3.56E+00	2.82E+00	3.63E+00	3.63E+00	3.56E+00
HWD	kg	0.00E+00	0.00E+00	9.09E-06	8.87E-06	7.21E-06
NHWD	kg	6.87E-02	9.45E-02	1.07E+00	1.05E+00	7.30E-01
RWD	kg	0.00E+00	0.00E+00	1.77E-03	1.72E-03	1.37E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Brisbane South and Gold Coast region

TABLE 17. ENVIRONMENTAL PROFILES (A1-A3), CONCRETE FOR SPECIAL APPLICATIONS, BRISBANE SOUTH AND GOLD COAST (QLD), PER M³

Indicator	Unit	ASPIRE® 40 GPa – 65 MPa	ASPIRE® 45 GPa – 80 MPa	ASPIRE® 50 GPa – 100 MPa
GWP	kg CO₂ eq	420	461	512
ODP	kg CFC11 eq	1.03E-05	1.17E-05	1.47E-05
AP	kg SO ₂ eq	1.90	2.09	2.43
EP	kg PO ₄ ³⁻ eq	0.246	0.270	0.309
POCP	kg C ₂ H ₄ eq	0.121	0.136	0.169
ADPE	kg Sb eq	2.83E-05	3.04E-05	4.47E-05
ADPF	MJ _{NCV}	3280	3640	4360

TABLE 18. ENVIRONMENTAL PARAMETERS (A1-A3), CONCRETE FOR SPECIAL APPLICATIONS, BRISBANE SOUTH AND GOLD COAST (QLD), PER M³

Parameter	Unit	ASPIRE® 40 GPa – 65 MPa	ASPIRE® 45 GPa – 80 MPa	ASPIRE® 50 GPa – 100 MPa
PERE	MJ _{NCV}	7.96E+01	9.83E+01	1.45E+02
PERM	MJ _{NCV}	2.12E-01	2.17E-01	3.99E-01
PERT	MJ _{NCV}	7.99E+01	9.85E+01	1.45E+02
PENRE	MJ _{NCV}	3.34E+03	3.70E+03	4.41E+03
PENRM	MJ _{NCV}	2.39E+01	2.66E+01	4.23E+01
PENRT	MJ _{NCV}	3.36E+03	3.73E+03	4.46E+03
SM	kg	1.61E+02	1.72E+02	2.70E+02
RSF	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00
FW	m ³	1.71E+01	2.37E+01	3.69E+01
HWD	kg	6.60E-05	7.06E-05	1.15E-04
NHWD	kg	5.70E+00	6.08E+00	8.64E+00
RWD	kg	8.72E-03	9.49E-03	1.44E-02
CRU	kg	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01
MER	kg	0.00E+00	0.00E+00	0.00E+00
EE	MJ	0.00E+00	0.00E+00	0.00E+00



Sunshine Coast region

Environmental profiles and parameters

Product table list

Sunshine Coast region

In each region, we start with presenting a summary of the carbon footprint (GWP summary) of our concrete mixes.

Lower carbon concrete products

Table No. 1 and 254

- ENVISIA® 20 MPa
- ENVISIA® 25 MPa
- ENVISIA® 32 MPa
- ENVISIA® 40 MPa
- ENVISIA® 50 MPa

Table No. 3 and 455

- ENVIROCRETE® PLUS 20 MPa
- ENVIROCRETE® PLUS 25 MPa
- ENVIROCRETE® PLUS 32 MPa
- ENVIROCRETE® PLUS 40 MPa
- ENVIROCRETE® PLUS 50 MPa

Table No. 5 and 656

- ENVIROCRETE® 20 MPa
- ENVIROCRETE® 25 MPa
- ENVIROCRETE® 32 MPa
- ENVIROCRETE® 40 MPa
- ENVIROCRETE® 50 MPa

Normal class concrete products

Table No. 7 and 857

- NORMAL CLASS GP BLEND 20 MPa
- NORMAL CLASS GP BLEND 25 MPa
- NORMAL CLASS GP BLEND 32 MPa
- NORMAL CLASS GP BLEND 40 MPa
- NORMAL CLASS GP BLEND 50 MPa

Table No. 9 and 1058

- NORMAL CLASS GP / FA BLEND 20 MPa
- NORMAL CLASS GP / FA BLEND 25 MPa
- NORMAL CLASS GP / FA BLEND 32 MPa
- NORMAL CLASS GP / FA BLEND 40 MPa
- NORMAL CLASS GP / FA BLEND 50 MPa

Concrete for special applications

Table No. 11 and 1259

- HIGH SLUMP 40 MPa
- HIGH SLUMP 50 MPa
- HIGH SLUMP 65 MPa
- HIGH SLUMP 80 MPa

Table No. 13 and 1460

- STABILISED SAND 10:1
- KERB MACHINE 280kg
- KERB MACHINE 320kg
- TMR MTRS 70 / 40 MPa 20mm PUMP B2 EXPOSURE
- TMR MTRS 70 / 40 MPa 20mm PUMP B2 EXPOSURE TREMIE B2 EXPOSURE
- TMR MTRS 70 / 50 MPa 20mm TREMIE B2 EXPOSURE

Table No. 15 and 1661

- LEAN MIX 20:1
- NO FINES 6:1
- POST TENSIONED 40 MPa 22@3
- POST TENSIONED 40 MPa 22@4
- SHOTCRETE 32 MPa

Cradle-to-gate GWP summary (kg CO₂ eq / m³)

Sunshine Coast region

ENVISIA® 20 MPa	ENVISIA® 25 MPa	ENVISIA® 32 MPa	ENVISIA® 40 MPa	ENVISIA® 50 MPa	
177	196	213	276	319	
ENVIROCRETE® PLUS 20 MPa	ENVIROCRETE® PLUS 25 MPa	ENVIROCRETE® PLUS 32 MPa	ENVIROCRETE® PLUS 40 MPa	ENVIROCRETE® PLUS 50 MPa	
183	200	220	243	319	
ENVIROCRETE® 20 MPa	ENVIROCRETE® 25 MPa	ENVIROCRETE® 32 MPa	ENVIROCRETE® 40 MPa	ENVIROCRETE® 50 MPa	
189	207	227	282	331	
NORMAL GP BLEND 20 MPa	NORMAL GP BLEND 25 MPa	NORMAL GP BLEND 32 MPa	NORMAL GP BLEND 40 MPa	NORMAL GP BLEND 50 MPa	
294	325	365	418	531	
NORMAL GP / FA BLEND 20 MPa	NORMAL GP / FA BLEND 25 MPa	NORMAL GP / FA BLEND 32 MPa	NORMAL GP / FA BLEND 40 MPa	NORMAL GP / FA BLEND 50 MPa	
239	263	272	316	418	
HIGH SLUMP 40 MPa	HIGH SLUMP 50 MPa	HIGH SLUMP 65 MPa	HIGH SLUMP 80 MPa		
324	359	372	571		
STABILISED SAND 10:1	KERB MACHINE 280kg	KERB MACHINE 320kg	TMR MTRS 70 / 40 MPa 20mm PUMP B2 EXPOSURE TREMIE B2 EXPOSURE	TMR MTRS 70 / 40 MPa 20mm PUMP B2 EXPOSURE	TMR MTRS 70 / 50 MPa 20mm TREMIE B2 EXPOSURE
168	265	304	388	378	429
LEAN MIX 20:1	NO FINES 6:1	POST TENSIONED 40 MPa 22@3	POST TENSIONED 40 MPa 22@4	SHOTCRETE 32 MPa	
109	268	393	377	345	

Sunshine Coast region

TABLE 1. ENVIRONMENTAL PROFILES (A1-A3), LOWER CARBON CONCRETE, SUNSHINE COAST (QLD), PER M³

Indicator	Unit	ENVISIA® 20 MPa	ENVISIA® 25 MPa	ENVISIA® 32 MPa	ENVISIA® 40 MPa	ENVISIA® 50 MPa
GWP	kg CO₂ eq	177	196	213	276	319
ODP	kg CFC11 eq	6.93E-06	7.44E-06	7.78E-06	9.28E-06	9.93E-06
AP	kg SO ₂ eq	0.956	1.05	1.15	1.49	1.73
EP	kg PO ₄ ³⁻ eq	0.124	0.136	0.146	0.185	0.211
POCP	kg C ₂ H ₄ eq	0.0699	0.0757	0.0801	0.0980	0.108
ADPE	kg Sb eq	3.55E-06	4.12E-06	4.51E-06	5.38E-06	7.47E-06
ADPF	MJ _{NCV}	1600	1750	1890	2400	2740

TABLE 2. ENVIRONMENTAL PARAMETERS (A1-A3), LOWER CARBON CONCRETE, SUNSHINE COAST (QLD), PER M³

Parameter	Unit	ENVISIA® 20 MPa	ENVISIA® 25 MPa	ENVISIA® 32 MPa	ENVISIA® 40 MPa	ENVISIA® 50 MPa
PERE	MJ _{NCV}	1.86E+01	2.09E+01	2.29E+01	2.98E+01	3.61E+01
PERM	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ _{NCV}	1.86E+01	2.09E+01	2.29E+01	2.98E+01	3.61E+01
PENRE	MJ _{NCV}	1.66E+03	1.82E+03	1.96E+03	2.48E+03	2.82E+03
PENRM	MJ _{NCV}	2.50E+00	3.82E+00	4.84E+00	5.76E+00	9.84E+00
PENRT	MJ _{NCV}	1.66E+03	1.82E+03	1.96E+03	2.48E+03	2.83E+03
SM	kg	1.56E+02	1.75E+02	1.93E+02	2.62E+02	3.12E+02
RSF	MJ _{NCV}	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
FW	m ³	3.33E+00	3.45E+00	3.50E+00	3.71E+00	3.59E+00
HWD	kg	4.86E-06	1.31E-05	1.60E-05	1.93E-05	3.54E-05
NHWD	kg	7.12E-01	1.77E+00	2.13E+00	2.56E+00	3.43E+00
RWD	kg	9.54E-04	2.60E-03	3.16E-03	3.81E-03	6.78E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Sunshine Coast region

TABLE 3. ENVIRONMENTAL PROFILES (A1-A3), LOWER CARBON CONCRETE, SUNSHINE COAST (QLD), PER M³

Indicator	Unit	ENVIROCRETE® PLUS 20 MPa	ENVIROCRETE® PLUS 25 MPa	ENVIROCRETE® PLUS 32 MPa	ENVIROCRETE® PLUS 40 MPa	ENVIROCRETE® PLUS 50 MPa
GWP	kg CO₂ eq	183	200	220	243	319
ODP	kg CFC11 eq	6.75E-06	7.05E-06	7.51E-06	7.94E-06	9.29E-06
AP	kg SO ₂ eq	0.926	1.01	1.11	1.22	1.60
EP	kg PO ₄ ³⁻ eq	0.124	0.133	0.145	0.159	0.202
POCP	kg C ₂ H ₄ eq	0.0686	0.0725	0.0781	0.0837	0.102
ADPE	kg Sb eq	7.56E-06	8.39E-06	9.69E-06	1.09E-05	1.52E-05
ADPF	MJ _{NCV}	1580	1700	1870	2040	2610

TABLE 4. ENVIRONMENTAL PARAMETERS (A1-A3), LOWER CARBON CONCRETE, SUNSHINE COAST (QLD), PER M³

Parameter	Unit	ENVIROCRETE® PLUS 20 MPa	ENVIROCRETE® PLUS 25 MPa	ENVIROCRETE® PLUS 32 MPa	ENVIROCRETE® PLUS 40 MPa	ENVIROCRETE® PLUS 50 MPa
PERE	MJ _{NCV}	1.84E+01	2.02E+01	2.29E+01	2.56E+01	3.48E+01
PERM	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ _{NCV}	1.84E+01	2.02E+01	2.29E+01	2.56E+01	3.48E+01
PENRE	MJ _{NCV}	1.64E+03	1.76E+03	1.93E+03	2.11E+03	2.69E+03
PENRM	MJ _{NCV}	2.95E+00	3.28E+00	6.00E+00	6.79E+00	1.15E+01
PENRT	MJ _{NCV}	1.64E+03	1.77E+03	1.94E+03	2.12E+03	2.70E+03
SM	kg	1.44E+02	1.60E+02	1.78E+02	2.01E+02	2.75E+02
RSF	MJ _{NCV}	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
FW	m ³	3.32E+00	3.32E+00	3.46E+00	3.48E+00	3.54E+00
HWD	kg	8.81E-06	9.83E-06	1.33E-05	1.51E-05	2.30E-05
NHWD	kg	1.82E+00	2.03E+00	2.22E+00	2.51E+00	3.42E+00
RWD	kg	1.87E-03	2.09E-03	2.73E-03	3.09E-03	4.64E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Sunshine Coast region

TABLE 5. ENVIRONMENTAL PROFILES (A1-A3), LOWER CARBON CONCRETE, SUNSHINE COAST (QLD), PER M³

Indicator	Unit	ENVIROCRETE® 20 MPa	ENVIROCRETE® 25 MPa	ENVIROCRETE® 32 MPa	ENVIROCRETE® 40 MPa	ENVIROCRETE® 50 MPa
GWP	kg CO₂ eq	189	207	227	282	331
ODP	kg CFC11 eq	6.66E-06	6.96E-06	7.39E-06	8.43E-06	9.15E-06
AP	kg SO ₂ eq	0.906	0.992	1.08	1.34	1.57
EP	kg PO ₄ ³⁻ eq	0.124	0.134	0.146	0.177	0.204
POCP	kg C ₂ H ₄ eq	0.0674	0.0714	0.0766	0.0896	0.0998
ADPE	kg Sb eq	3.46E-06	3.80E-06	4.56E-06	5.18E-06	7.22E-06
ADPF	Mj _{NCV}	1550	1680	1830	2220	2570

TABLE 6. ENVIRONMENTAL PARAMETERS (A1-A3), LOWER CARBON CONCRETE, SUNSHINE COAST (QLD), PER M³

Parameter	Unit	ENVIROCRETE® 20 MPa	ENVIROCRETE® 25 MPa	ENVIROCRETE® 32 MPa	ENVIROCRETE® 40 MPa	ENVIROCRETE® 50 MPa
PERE	Mj _{NCV}	1.61E+01	1.78E+01	2.00E+01	2.47E+01	3.02E+01
PERM	Mj _{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	Mj _{NCV}	1.61E+01	1.78E+01	2.00E+01	2.47E+01	3.02E+01
PENRE	Mj _{NCV}	1.61E+03	1.74E+03	1.90E+03	2.30E+03	2.65E+03
PENRM	Mj _{NCV}	2.46E+00	2.73E+00	5.00E+00	5.66E+00	9.63E+00
PENRT	Mj _{NCV}	1.62E+03	1.74E+03	1.90E+03	2.30E+03	2.66E+03
SM	kg	1.30E+02	1.46E+02	1.61E+02	2.08E+02	2.50E+02
RSF	Mj _{NCV}	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
FW	m ³	3.33E+00	3.33E+00	3.48E+00	3.58E+00	3.56E+00
HWD	kg	4.78E-06	5.30E-06	7.65E-06	8.66E-06	1.39E-05
NHWD	kg	6.77E-01	7.53E-01	8.27E-01	9.41E-01	1.26E+00
RWD	kg	9.39E-04	1.04E-03	1.47E-03	1.66E-03	2.63E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Sunshine Coast region

TABLE 7. ENVIRONMENTAL PROFILES (A1-A3), NORMAL CLASS CONCRETE, SUNSHINE COAST (QLD), PER M³

Indicator	Unit	NORMAL CLASS GP BLEND 20 MPa	NORMAL CLASS GP BLEND 25 MPa	NORMAL CLASS GP BLEND 32 MPa	NORMAL CLASS GP BLEND 40 MPa	NORMAL CLASS GP BLEND 50 MPa
GWP	kg CO ₂ eq	294	325	365	418	531
ODP	kg CFC11 eq	7.34E-06	7.74E-06	8.41E-06	9.06E-06	1.04E-05
AP	kg SO ₂ eq	1.20	1.32	1.48	1.69	2.12
EP	kg PO ₄ ³⁻ eq	0.169	0.185	0.207	0.233	0.290
POCP	kg C ₂ H ₄ eq	0.0793	0.0850	0.0933	0.0903	0.122
ADPE	kg Sb eq	3.69E-06	4.07E-06	4.73E-06	5.47E-06	7.66E-06
ADPF	MJ _{NCV}	2040	2240	2490	2810	3500

TABLE 8. ENVIRONMENTAL PARAMETERS (A1-A3), NORMAL CLASS CONCRETE, SUNSHINE COAST (QLD), PER M³

Parameter	Unit	NORMAL CLASS GP BLEND 20 MPa	NORMAL CLASS GP BLEND 25 MPa	NORMAL CLASS GP BLEND 32 MPa	NORMAL CLASS GP BLEND 40 MPa	NORMAL CLASS GP BLEND 50 MPa
PERE	MJ _{NCV}	2.02E+01	2.24E+01	2.56E+01	2.93E+01	3.80E+01
PERM	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ _{NCV}	2.02E+01	2.24E+01	2.56E+01	2.93E+01	3.80E+01
PENRE	MJ _{NCV}	2.11E+03	2.30E+03	2.56E+03	2.89E+03	3.59E+03
PENRM	MJ _{NCV}	2.46E+00	2.75E+00	4.75E+00	5.66E+00	9.63E+00
PENRT	MJ _{NCV}	2.11E+03	2.31E+03	2.57E+03	2.90E+03	3.60E+03
SM	kg	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
NRSF	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m ³	3.63E+00	3.68E+00	3.90E+00	3.98E+00	4.14E+00
HWD	kg	4.78E-06	5.32E-06	7.54E-06	8.66E-06	1.39E-05
NHWD	kg	6.75E-01	7.51E-01	7.94E-01	9.31E-01	1.26E+00
RWD	kg	9.39E-04	1.05E-03	1.44E-03	1.66E-03	2.63E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Sunshine Coast region

TABLE 9. ENVIRONMENTAL PROFILES (A1-A3), NORMAL CLASS CONCRETE, SUNSHINE COAST (QLD), PER M³

Indicator	Unit	NORMAL CLASS GP / FA BLEND 20 MPa	NORMAL CLASS GP / FA BLEND 25 MPa	NORMAL CLASS GP / FA BLEND 32 MPa	NORMAL CLASS GP / FA BLEND 40 MPa	NORMAL CLASS GP / FA BLEND 50 MPa
GWP	kg CO ₂ eq	239	263	272	316	418
ODP	kg CFC11 eq	6.74E-06	7.05E-06	7.29E-06	7.85E-06	9.16E-06
AP	kg SO ₂ eq	0.985	1.08	1.11	1.29	1.68
EP	kg PO ₄ ³⁻ eq	0.142	0.154	0.160	0.182	0.233
POCP	kg C ₂ H ₄ eq	0.0705	0.0747	0.0774	0.0852	0.104
ADPE	kg Sb eq	3.54E-06	3.91E-06	4.48E-06	5.20E-06	7.36E-06
ADPF	MJ _{NCV}	1730	1870	1940	2210	2840

TABLE 10. ENVIRONMENTAL PARAMETERS (A1-A3), NORMAL CLASS CONCRETE, SUNSHINE COAST (QLD), PER M³

Parameter	Unit	NORMAL CLASS GP / FA BLEND 20 MPa	NORMAL CLASS GP / FA BLEND 25 MPa	NORMAL CLASS GP / FA BLEND 32 MPa	NORMAL CLASS GP / FA BLEND 40 MPa	NORMAL CLASS GP / FA BLEND 50 MPa
PERE	MJ _{NCV}	1.67E+01	1.84E+01	1.96E+01	2.27E+01	3.07E+01
PERM	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ _{NCV}	1.67E+01	1.84E+01	1.96E+01	2.27E+01	3.07E+01
PENRE	MJ _{NCV}	1.78E+03	1.93E+03	2.00E+03	2.28E+03	2.91E+03
PENRM	MJ _{NCV}	2.46E+00	2.75E+00	4.75E+00	5.66E+00	9.63E+00
PENRT	MJ _{NCV}	1.79E+03	1.93E+03	2.01E+03	2.28E+03	2.92E+03
SM	kg	6.45E+01	7.28E+01	7.59E+01	9.05E+01	1.23E+02
RSF	MJ _{NCV}	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
FW	m ³	3.47E+00	3.50E+00	3.63E+00	3.69E+00	3.82E+00
HWD	kg	4.78E-06	5.32E-06	7.54E-06	8.66E-06	1.39E-05
NHWD	kg	6.64E-01	7.37E-01	7.74E-01	9.09E-01	1.24E+00
RWD	kg	9.39E-04	1.05E-03	1.44E-03	1.66E-03	2.63E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Sunshine Coast region

TABLE 11. ENVIRONMENTAL PROFILES (A1-A3), CONCRETE FOR SPECIAL APPLICATIONS, SUNSHINE COAST (QLD), PER M³

Indicator	Unit	HIGH SLUMP 40 MPa	HIGH SLUMP 50 MPa	HIGH SLUMP 65 MPa	HIGH SLUMP 80 MPa
GWP	kg CO₂ eq	324	359	372	571
ODP	kg CFC11 eq	9.24E-06	9.83E-06	9.61E-06	1.14E-05
AP	kg SO ₂ eq	1.55	1.69	1.66	2.29
EP	kg PO ₄ ³⁻ eq	0.202	0.221	0.221	0.313
POCP	kg C ₂ H ₄ eq	0.100	0.108	0.106	0.135
ADPE	kg Sb eq	1.07E-05	5.13E-06	1.61E-05	2.61E-05
ADPF	MJ _{NCV}	2570	2800	2760	3850

TABLE 12. ENVIRONMENTAL PARAMETERS (A1-A3), CONCRETE FOR SPECIAL APPLICATIONS, SUNSHINE COAST (QLD), PER M³

Parameter	Unit	HIGH SLUMP 40 MPa	HIGH SLUMP 50 MPa	HIGH SLUMP 65 MPa	HIGH SLUMP 80 MPa
PERE	MJ _{NCV}	3.17E+01	3.35E+01	3.49E+01	5.17E+01
PERM	MJ _{NCV}	0.00E+00	0.00E+00	9.29E-02	2.05E-01
PERT	MJ _{NCV}	3.17E+01	3.35E+01	3.50E+01	5.19E+01
PENRE	MJ _{NCV}	2.64E+03	2.88E+03	2.84E+03	3.94E+03
PENRM	MJ _{NCV}	1.31E+01	1.47E+01	6.88E+00	1.52E+01
PENRT	MJ _{NCV}	2.66E+03	2.89E+03	2.85E+03	3.96E+03
SM	kg	2.50E+02	2.70E+02	2.38E+02	1.27E+02
RSF	MJ _{NCV}	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
FW	m ³	3.71E+00	3.80E+00	3.84E+00	4.34E+00
HWD	kg	2.01E-05	1.86E-05	2.88E-05	5.57E-05
NHWD	kg	2.03E+00	2.58E-01	3.66E+00	5.57E+00
RWD	kg	3.86E-03	3.16E-03	4.02E-03	7.04E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Sunshine Coast region

TABLE 13. ENVIRONMENTAL PROFILES (A1-A3), CONCRETE FOR SPECIAL APPLICATIONS, SUNSHINE COAST (QLD), PER M³

Indicator	Unit	STABILISED SAND 10:1	KERB MACHINE 280kg	KERB MACHINE 320kg	TMR MTRS 70 / 40 MPa 20mm PUMP B2 EXPOSURE TREMIE B2 EXPOSURE	TMR MTRS 70 / 40 MPa 20mm PUMP B2 EXPOSURE	TMR MTRS 70 / 50 MPa 20mm TREMIE B2 EXPOSURE
GWP	kg CO₂ eq	168	265	304	388	378	429
ODP	kg CFC11 eq	5.79E-06	7.24E-06	7.73E-06	8.77E-06	8.71E-06	9.33E-06
AP	kg SO ₂ eq	0.704	1.09	1.24	1.57	1.53	1.73
EP	kg PO ₄ ³⁻ eq	0.105	0.156	0.176	0.218	0.214	0.239
POCP	kg C ₂ H ₄ eq	0.0573	0.0764	0.0833	0.0989	0.0969	0.107
ADPE	kg Sb eq	6.60E-07	4.05E-06	4.69E-06	1.39E-05	6.50E-06	1.54E-05
ADPF	MJ _{NCV}	1270	1890	2130	2680	2600	2930

TABLE 14. ENVIRONMENTAL PARAMETERS (A1-A3), CONCRETE FOR SPECIAL APPLICATIONS, SUNSHINE COAST (QLD), PER M³

Parameter	Unit	STABILISED SAND 10:1	KERB MACHINE 280kg	KERB MACHINE 320kg	TMR MTRS 70 / 40 MPa 20mm PUMP B2 EXPOSURE TREMIE B2 EXPOSURE	TMR MTRS 70 / 40 MPa 20mm PUMP B2 EXPOSURE	TMR MTRS 70 / 50 MPa 20mm TREMIE B2 EXPOSURE
PERE	MJ _{NCV}	1.05E+01	1.86E+01	2.14E+01	3.09E+01	2.76E+01	3.42E+01
PERM	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.35E-02	1.08E-01
PERT	MJ _{NCV}	1.05E+01	1.86E+01	2.14E+01	3.09E+01	2.76E+01	3.42E+01
PENRE	MJ _{NCV}	1.32E+03	1.95E+03	2.20E+03	2.75E+03	2.67E+03	3.01E+03
PENRM	MJ _{NCV}	0.00E+00	3.44E+00	4.06E+00	9.99E+00	8.03E+00	1.09E+01
PENRT	MJ _{NCV}	1.32E+03	1.96E+03	2.20E+03	2.76E+03	2.68E+03	3.02E+03
SM	kg	5.41E+01	7.28E+01	8.63E+01	1.12E+02	1.14E+02	1.09E+02
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	3.01E+00	3.52E+00	3.54E+00	3.76E+00	3.81E+00	3.85E+00
HWD	kg	0.00E+00	6.06E-06	7.10E-06	2.04E-05	1.18E-05	2.25E-05
NHWD	kg	6.24E-02	7.40E-01	8.66E-01	3.09E+00	1.10E+00	3.44E+00
RWD	kg	0.00E+00	1.17E-03	1.38E-03	4.14E-03	2.24E-03	4.57E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
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

Sunshine Coast region

TABLE 15. ENVIRONMENTAL PROFILES (A1-A3), CONCRETE FOR SPECIAL APPLICATIONS, SUNSHINE COAST (QLD), PER M³

Indicator	Unit	LEAN MIX 20:1	NO FINES 6:1	POST TENSIONED 40 MPa 22@3	POST TENSIONED 40 MPa 22@4	SHOTCRETE 32 MPa
GWP	kg CO₂ eq	109	268	393	377	345
ODP	kg CFC11 eq	4.94E-06	6.06E-06	8.83E-06	8.65E-06	8.25E-06
AP	kg SO ₂ eq	0.472	1.08	1.59	1.53	1.40
EP	kg PO ₄ ³⁻ eq	0.0756	0.152	0.221	0.213	0.196
POCP	kg C ₂ H ₄ eq	0.0458	0.0671	0.0991	0.0963	0.0907
ADPE	kg Sb eq	6.62E-07	1.04E-06	6.51E-06	6.24E-06	5.63E-06
ADPF	MJ _{NCV}	920	1810	2680	2580	2380

TABLE 16. ENVIRONMENTAL PARAMETERS (A1-A3), CONCRETE FOR SPECIAL APPLICATIONS, SUNSHINE COAST (QLD), PER M³

Parameter	Unit	LEAN MIX 20:1	NO FINES 6:1	POST TENSIONED 40 MPa 22@3	POST TENSIONED 40 MPa 22@4	SHOTCRETE 32 MPa
PERE	MJ _{NCV}	6.99E+00	1.75E+01	2.83E+01	2.72E+01	2.47E+01
PERM	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ _{NCV}	6.99E+00	1.75E+01	2.83E+01	2.72E+01	2.45E+03
PENRE	MJ _{NCV}	9.64E+02	1.86E+03	2.75E+03	2.65E+03	2.40E+03
PENRM	MJ _{NCV}	0.00E+00	0.00E+00	7.21E+00	6.88E+00	6.23E+00
PENRT	MJ _{NCV}	9.64E+02	1.86E+03	2.76E+03	2.66E+03	2.46E+03
SM	kg	2.39E+01	0.00E+00	1.14E+02	1.09E+02	9.88E+01
RSF	MJ _{NCV}	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
FW	m ³	3.22E+00	2.92E+00	3.77E+00	3.77E+00	3.64E+00
HWD	kg	0.00E+00	0.00E+00	1.10E-05	1.05E-05	9.54E-06
NHWD	kg	5.67E-02	8.82E-02	1.15E+00	1.10E+00	9.96E-01
RWD	kg	0.00E+00	0.00E+00	2.12E-03	2.03E-03	1.83E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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



Darling Downs region

Environmental profiles and parameters

Product table list

Darling Downs region

In each region, we start with presenting a summary of the carbon footprint (GWP summary) of our concrete mixes.

Lower carbon concrete products

Table No. 1 and 265

- ENVISIA® 20 MPa
- ENVISIA® 25 MPa
- ENVISIA® 32 MPa
- ENVISIA® 40 MPa
- ENVISIA® 50 MPa

Table No. 3 and 466

- ENVIROCRETE® PLUS 20 MPa
- ENVIROCRETE® PLUS 25 MPa
- ENVIROCRETE® PLUS 32 MPa
- ENVIROCRETE® PLUS 40 MPa
- ENVIROCRETE® PLUS 50 MPa

Table No. 5 and 667

- ENVIROCRETE® 20 MPa
- ENVIROCRETE® 25 MPa
- ENVIROCRETE® 32 MPa
- ENVIROCRETE® 40 MPa
- ENVIROCRETE® 50 MPa

Normal class concrete products

Table No. 7 and 868

- NORMAL CLASS GP BLEND 20 MPa
- NORMAL CLASS GP BLEND 25 MPa
- NORMAL CLASS GP BLEND 32 MPa
- NORMAL CLASS GP BLEND 40 MPa
- NORMAL CLASS GP BLEND 50 MPa

Table No. 9 and 1069

- NORMAL CLASS GP / FA BLEND 20 MPa
- NORMAL CLASS GP / FA BLEND 25 MPa
- NORMAL CLASS GP / FA BLEND 32 MPa
- NORMAL CLASS GP / FA BLEND 40 MPa
- NORMAL CLASS GP / FA BLEND 50 MPa

Concrete for special applications

Table No. 11 and 1270

- HIGH SLUMP 40 MPa
- HIGH SLUMP 50 MPa
- HIGH SLUMP 65 MPa

Table No. 13 and 1471

- STABILISED SAND 12:1
- KERB MACHINE 280kg
- KERB MACHINE 320kg
- TMR MTRS 70 / 40 MPa 20mm PUMP B2 EXPOSURE
- TMR MTRS 70 / 40 MPa 20mm PUMP B2 EXPOSURE TREMIE B2 EXPOSURE
- TMR MTRS 70 / 50 MPa 20mm TREMIE B2 EXPOSURE

Table No. 15 and 1672

- NO FINES 6:1
- POST TENSIONED 40 MPa 22@3
- POST TENSIONED 40 MPa 22@4
- SHOTCRETE 32 MPa

Cradle-to-gate GWP summary (kg CO₂ eq / m³)

Darling Downs region

ENVISIA® 20 MPa	ENVISIA® 25 MPa	ENVISIA® 32 MPa	ENVISIA® 40 MPa	ENVISIA® 50 MPa	
174	192	209	285	360	
ENVIROCRETE® PLUS 20 MPa	ENVIROCRETE® PLUS 25 MPa	ENVIROCRETE® PLUS 32 MPa	ENVIROCRETE® PLUS 40 MPa	ENVIROCRETE® PLUS 50 MPa	
194	208	232	251	312	
ENVIROCRETE® 20 MPa	ENVIROCRETE® 25 MPa	ENVIROCRETE® 32 MPa	ENVIROCRETE® 40 MPa	ENVIROCRETE® 50 MPa	
197	217	243	294	345	
NORMAL GP BLEND 20 MPa	NORMAL GP BLEND 25 MPa	NORMAL GP BLEND 32 MPa	NORMAL GP BLEND 40 MPa	NORMAL GP BLEND 50 MPa	
311	333	376	463	550	
NORMAL GP / FA BLEND 20 MPa	NORMAL GP / FA BLEND 25 MPa	NORMAL GP / FA BLEND 32 MPa	NORMAL GP / FA BLEND 40 MPa	NORMAL GP / FA BLEND 50 MPa	
242	266	299	364	430	
HIGH SLUMP 40 MPa	HIGH SLUMP 50 MPa	HIGH SLUMP 65 MPa			
392	430	560			
STABILISED SAND 12:1	KERB MACHINE 280kg	KERB MACHINE 320kg	TMR MTRS 70 / 40 MPa 20mm PUMP B2 EXPOSURE TREMIE B2 EXPOSURE	TMR MTRS 70 / 40 MPa 20mm PUMP B2 EXPOSURE	TMR MTRS 70 / 50 MPa 20mm TREMIE B2 EXPOSURE
143	257	289	393	373	404
NO FINES 6:1	POST TENSIONED 40 MPa 22@3	POST TENSIONED 40 MPa 22@4	SHOTCRETE 32 MPa		
253	394	386	355		

Darling Downs region

TABLE 1. ENVIRONMENTAL PROFILES (A1-A3), LOWER CARBON CONCRETE, DARLING DOWNS (QLD), PER M³

Indicator	Unit	ENVISIA® 20 MPa	ENVISIA® 25 MPa	ENVISIA® 32 MPa	ENVISIA® 40 MPa	ENVISIA® 50 MPa
GWP	kg CO₂ eq	174	192	209	285	360
ODP	kg CFC11 eq	5.50E-06	5.88E-06	6.26E-06	7.99E-06	9.74E-06
AP	kg SO ₂ eq	0.923	1.02	1.11	1.52	1.93
EP	kg PO ₄ ³⁻ eq	0.118	0.129	0.139	0.186	0.232
POCP	kg C ₂ H ₄ eq	0.0583	0.0631	0.0679	0.0890	0.110
ADPE	kg Sb eq	7.60E-06	8.64E-06	9.75E-06	1.23E-05	1.47E-05
ADPF	MJ _{NCV}	1550	1700	1840	2460	3070

TABLE 2. ENVIRONMENTAL PARAMETERS (A1-A3), LOWER CARBON CONCRETE, DARLING DOWNS (QLD), PER M³

Parameter	Unit	ENVISIA® 20 MPa	ENVISIA® 25 MPa	ENVISIA® 32 MPa	ENVISIA® 40 MPa	ENVISIA® 50 MPa
PERE	MJ _{NCV}	2.26E+01	2.49E+01	2.73E+01	3.66E+01	4.58E+01
PERM	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ _{NCV}	2.26E+01	2.49E+01	2.73E+01	3.66E+01	4.58E+01
PENRE	MJ _{NCV}	1.60E+03	1.75E+03	1.89E+03	2.52E+03	3.15E+03
PENRM	MJ _{NCV}	6.12E+00	6.99E+00	8.22E+00	1.17E+01	1.51E+01
PENRT	MJ _{NCV}	1.61E+03	1.75E+03	1.90E+03	2.53E+03	3.17E+03
SM	kg	1.56E+02	1.75E+02	1.93E+02	2.75E+02	3.56E+02
RSF	MJ _{NCV}	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
FW	m ³	3.70E+00	3.71E+00	3.71E+00	3.83E+00	3.99E+00
HWD	kg	1.16E-05	1.33E-05	1.53E-05	2.05E-05	2.54E-05
NHWD	kg	1.72E+00	1.96E+00	2.19E+00	2.69E+00	3.13E+00
RWD	kg	2.33E-03	2.66E-03	3.06E-03	4.05E-03	4.98E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Darling Downs region

TABLE 3. ENVIRONMENTAL PROFILES (A1-A3), LOWER CARBON CONCRETE, DARLING DOWNS (QLD), PER M³

Indicator	Unit	ENVIROCRETE® PLUS 20 MPa	ENVIROCRETE® PLUS 25 MPa	ENVIROCRETE® PLUS 32 MPa	ENVIROCRETE® PLUS 40 MPa	ENVIROCRETE® PLUS 50 MPa
GWP	kg CO ₂ eq	194	208	232	251	312
ODP	kg CFC11 eq	5.48E-06	5.77E-06	6.26E-06	5.82E-06	6.80E-06
AP	kg SO ₂ eq	0.954	1.03	1.15	1.07	1.32
EP	kg PO ₄ ³⁻ eq	0.126	0.134	0.148	0.148	0.180
POCP	kg C ₂ H ₄ eq	0.0589	0.0626	0.0687	0.0652	0.0780
ADPE	kg Sb eq	6.64E-06	7.31E-06	8.22E-06	9.89E-06	1.27E-05
ADPF	MJ _{NCV}	1620	1730	1910	1870	2270

TABLE 4. ENVIRONMENTAL PARAMETERS (A1-A3), LOWER CARBON CONCRETE, DARLING DOWNS (QLD), PER M³

Parameter	Unit	ENVIROCRETE® PLUS 20 MPa	ENVIROCRETE® PLUS 25 MPa	ENVIROCRETE® PLUS 32 MPa	ENVIROCRETE® PLUS 40 MPa	ENVIROCRETE® PLUS 50 MPa
PERE	MJ _{NCV}	2.24E+01	2.40E+01	2.66E+01	2.54E+01	3.05E+01
PERM	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ _{NCV}	2.24E+01	2.40E+01	2.66E+01	2.54E+01	3.05E+01
PENRE	MJ _{NCV}	1.67E+03	1.78E+03	1.96E+03	1.92E+03	2.32E+03
PENRM	MJ _{NCV}	5.90E+00	6.56E+00	7.43E+00	9.18E+00	8.99E+00
PENRT	MJ _{NCV}	1.67E+03	1.79E+03	1.97E+03	1.93E+03	2.33E+03
SM	kg	1.57E+02	1.72E+02	1.94E+02	2.40E+02	3.04E+02
RSF	MJ _{NCV}	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
FW	m ³	3.78E+00	3.79E+00	3.81E+00	3.77E+00	3.77E+00
HWD	kg	1.04E-05	1.15E-05	1.31E-05	1.62E-05	1.85E-05
NHWD	kg	1.43E+00	1.57E+00	1.77E+00	2.11E+00	2.89E+00
RWD	kg	2.05E-03	2.28E-03	2.58E-03	3.19E-03	3.75E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Darling Downs region

TABLE 5. ENVIRONMENTAL PROFILES (A1-A3), LOWER CARBON CONCRETE, DARLING DOWNS (QLD), PER M³

Indicator	Unit	ENVIROCRETE® 20 MPa	ENVIROCRETE® 25 MPa	ENVIROCRETE® 32 MPa	ENVIROCRETE® 40 MPa	ENVIROCRETE® 50 MPa
GWP	kg CO₂ eq	197	217	243	294	345
ODP	kg CFC11 eq	4.97E-06	5.31E-06	5.78E-06	6.69E-06	7.51E-06
AP	kg SO ₂ eq	0.863	0.949	1.06	1.29	1.51
EP	kg PO ₄ ³⁻ eq	0.121	0.131	0.146	0.174	0.201
POCP	kg C ₂ H ₄ eq	0.0536	0.0580	0.0638	0.0753	0.0861
ADPE	kg Sb eq	3.41E-06	3.74E-06	4.18E-06	5.08E-06	6.15E-06
ADPF	MJ _{NCV}	1500	1630	1810	2160	2500

TABLE 6. ENVIRONMENTAL PARAMETERS (A1-A3), LOWER CARBON CONCRETE, DARLING DOWNS (QLD), PER M³

Parameter	Unit	ENVIROCRETE® 20 MPa	ENVIROCRETE® 25 MPa	ENVIROCRETE® 32 MPa	ENVIROCRETE® 40 MPa	ENVIROCRETE® 50 MPa
PERE	MJ _{NCV}	1.84E+01	2.00E+01	2.21E+01	2.63E+01	3.07E+01
PERM	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ _{NCV}	1.84E+01	2.00E+01	2.00E+01	2.63E+01	3.07E+01
PENRE	MJ _{NCV}	1.54E+03	1.68E+03	1.68E+03	2.21E+03	2.56E+03
PENRM	MJ _{NCV}	3.55E+00	3.96E+00	3.96E+00	5.60E+00	7.50E+00
PENRT	MJ _{NCV}	1.54E+03	1.68E+03	1.68E+03	2.22E+03	2.57E+03
SM	kg	1.22E+02	1.35E+02	1.35E+02	1.91E+02	2.29E+02
RSF	MJ _{NCV}	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
FW	m ³	3.73E+00	3.74E+00	3.74E+00	3.90E+00	3.83E+00
HWD	kg	5.50E-06	6.12E-06	6.12E-06	8.47E-06	1.10E-05
NHWD	kg	6.37E-01	6.99E-01	6.99E-01	9.48E-01	1.12E+00
RWD	kg	1.05E-03	1.17E-03	1.17E-03	1.62E-03	2.09E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Darling Downs region

TABLE 7. ENVIRONMENTAL PROFILES (A1-A3), NORMAL CLASS CONCRETE, DARLING DOWNS (QLD), PER M³

Indicator	Unit	NORMAL CLASS GP BLEND 20 MPa	NORMAL CLASS GP BLEND 25 MPa	NORMAL CLASS GP BLEND 32 MPa	NORMAL CLASS GP BLEND 40 MPa	NORMAL CLASS GP BLEND 50 MPa
GWP	kg CO₂ eq	311	333	376	463	550
ODP	kg CFC11 eq	6.31E-06	6.61E-06	7.25E-06	8.48E-06	9.71E-06
AP	kg SO ₂ eq	1.24	1.33	1.50	1.84	2.18
EP	kg PO ₄ ³⁻ eq	0.175	0.186	0.208	0.253	0.297
POCP	kg C ₂ H ₄ eq	0.0722	0.0763	0.0847	0.101	0.118
ADPE	kg Sb eq	3.55E-06	3.89E-06	4.38E-06	5.38E-06	6.56E-06
ADPF	MJ _{NCV}	2110	2240	2510	3050	3590

TABLE 8. ENVIRONMENTAL PARAMETERS (A1-A3), NORMAL CLASS CONCRETE, DARLING DOWNS (QLD), PER M³

Parameter	Unit	NORMAL CLASS GP BLEND 20 MPa	NORMAL CLASS GP BLEND 25 MPa	NORMAL CLASS GP BLEND 32 MPa	NORMAL CLASS GP BLEND 40 MPa	NORMAL CLASS GP BLEND 50 MPa
PERE	MJ _{NCV}	2.36E+01	2.52E+01	2.82E+01	3.43E+01	4.05E+01
PERM	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ _{NCV}	2.36E+01	2.52E+01	2.82E+01	3.43E+01	4.05E+01
PENRE	MJ _{NCV}	2.16E+03	2.30E+03	2.57E+03	3.12E+03	3.66E+03
PENRM	MJ _{NCV}	3.55E+00	3.96E+00	4.51E+00	5.60E+00	7.50E+00
PENRT	MJ _{NCV}	2.17E+03	2.30E+03	2.58E+03	3.12E+03	3.67E+03
SM	kg	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
NRSF	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m ³	4.02E+00	4.05E+00	4.16E+00	4.30E+00	4.42E+00
HWD	kg	5.50E-06	6.12E-06	6.82E-06	8.47E-06	1.10E-05
NHWD	kg	6.36E-01	6.97E-01	7.82E-01	9.52E-01	1.13E+00
RWD	kg	1.05E-03	1.17E-03	1.31E-03	1.62E-03	2.09E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Darling Downs region

TABLE 9. ENVIRONMENTAL PROFILES (A1-A3), NORMAL CLASS CONCRETE, DARLING DOWNS (QLD), PER M³

Indicator	Unit	NORMAL CLASS GP / FA BLEND 20 MPa	NORMAL CLASS GP / FA BLEND 25 MPa	NORMAL CLASS GP / FA BLEND 32 MPa	NORMAL CLASS GP / FA BLEND 40 MPa	NORMAL CLASS GP / FA BLEND 50 MPa
GWP	kg CO₂ eq	242	266	299	364	430
ODP	kg CFC11 eq	5.36E-06	5.72E-06	6.21E-06	7.14E-06	8.09E-06
AP	kg SO ₂ eq	0.972	1.07	1.20	1.45	1.71
EP	kg PO ₄ ³⁻ eq	0.139	0.151	0.168	0.202	0.236
POCP	kg C ₂ H ₄ eq	0.0594	0.0641	0.0705	0.0830	0.0958
ADPE	kg Sb eq	3.37E-06	3.72E-06	4.18E-06	5.12E-06	6.25E-06
ADPF	MJ _{NCV}	1690	1840	2040	2450	2860

TABLE 10. ENVIRONMENTAL PARAMETERS (A1-A3), NORMAL CLASS CONCRETE, DARLING DOWNS (QLD), PER M³

Parameter	Unit	NORMAL CLASS GP / FA BLEND 20 MPa	NORMAL CLASS GP / FA BLEND 25 MPa	NORMAL CLASS GP / FA BLEND 32 MPa	NORMAL CLASS GP / FA BLEND 40 MPa	NORMAL CLASS GP / FA BLEND 50 MPa
PERE	MJ _{NCV}	1.92E+01	2.09E+01	2.32E+01	2.79E+01	3.29E+01
PERM	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ _{NCV}	1.92E+01	2.09E+01	2.32E+01	2.79E+01	3.29E+01
PENRE	MJ _{NCV}	1.73E+03	1.89E+03	2.10E+03	2.51E+03	2.93E+03
PENRM	MJ _{NCV}	3.55E+00	3.96E+00	4.51E+00	5.60E+00	7.50E+00
PENRT	MJ _{NCV}	1.74E+03	1.89E+03	2.10E+03	2.51E+03	2.94E+03
SM	kg	6.76E+01	7.59E+01	8.63E+01	1.07E+02	1.27E+02
RSF	MJ _{NCV}	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
FW	m ³	3.82E+00	3.86E+00	3.94E+00	4.01E+00	4.08E+00
HWD	kg	5.50E-06	6.12E-06	6.82E-06	8.47E-06	1.10E-05
NHWD	kg	6.21E-01	6.83E-01	7.66E-01	9.31E-01	1.10E+00
RWD	kg	1.05E-03	1.17E-03	1.31E-03	1.62E-03	2.09E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Darling Downs region

TABLE 11. ENVIRONMENTAL PROFILES (A1-A3), CONCRETE FOR SPECIAL APPLICATIONS, DARLING DOWNS (QLD), PER M³

Indicator	Unit	HIGH SLUMP 40 MPa	HIGH SLUMP 50 MPa	HIGH SLUMP 65 MPa
GWP	kg CO₂ eq	392	430	560
ODP	kg CFC11 eq	7.32E-06	8.09E-06	9.86E-06
AP	kg SO ₂ eq	1.55	1.71	2.21
EP	kg PO ₄ ³⁻ eq	0.216	0.236	0.303
POCP	kg C ₂ H ₄ eq	0.0872	0.0958	0.121
ADPE	kg Sb eq	1.08E-05	6.25E-06	1.61E-05
ADPF	MJ _{NCV}	2650	2860	3750

TABLE 12. ENVIRONMENTAL PARAMETERS (A1-A3), CONCRETE FOR SPECIAL APPLICATIONS, DARLING DOWNS (QLD), PER M³

Parameter	Unit	HIGH SLUMP 40 MPa	HIGH SLUMP 50 MPa	HIGH SLUMP 65 MPa
PERE	MJ _{NCV}	3.34E+01	3.29E+01	4.88E+01
PERM	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00
PERT	MJ _{NCV}	3.34E+01	3.34E+01	4.88E+01
PENRE	MJ _{NCV}	2.71E+03	2.71E+03	3.82E+03
PENRM	MJ _{NCV}	1.31E+01	1.31E+01	2.95E+01
PENRT	MJ _{NCV}	2.72E+03	2.72E+03	3.84E+03
SM	kg	1.04E+02	1.04E+02	1.25E+02
RSF	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00
FW	m ³	3.96E+00	3.96E+00	4.20E+00
HWD	kg	2.01E-05	2.01E-05	3.89E-05
NHWD	kg	2.05E+00	2.05E+00	2.53E+00
RWD	kg	3.86E-03	3.86E-03	7.20E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01
MER	kg	0.00E+00	0.00E+00	0.00E+00
EE	MJ	0.00E+00	0.00E+00	0.00E+00

Darling Downs region

TABLE 13. ENVIRONMENTAL PROFILES (A1-A3), CONCRETE FOR SPECIAL APPLICATIONS, DARLING DOWNS (QLD), PER M³

Indicator	Unit	STABILISED SAND 12:1	KERB MACHINE 280kg	KERB MACHINE 320kg	TMR MTRS 70 / 40 MPa 20mm PUMP B2 EXPOSURE TREMIE B2 EXPOSURE	TMR MTRS 70 / 40 MPa 20mm PUMP B2 EXPOSURE	TMR MTRS 70 / 50 MPa 20mm TREMIE B2 EXPOSURE
GWP	kg CO ₂ eq	143	257	289	393	373	404
ODP	kg CFC11 eq	3.54E-06	5.55E-06	5.99E-06	7.52E-06	7.28E-06	7.70E-06
AP	kg SO ₂ eq	0.577	1.03	1.16	1.57	1.49	1.61
EP	kg PO ₄ ³⁻ eq	0.086	0.147	0.163	0.217	0.207	0.222
POCP	kg C ₂ H ₄ eq	0.0372	0.0622	0.0682	0.0892	0.0849	0.0916
ADPE	kg Sb eq	6.97E-07	3.55E-06	4.02E-06	1.41E-05	5.36E-06	1.63E-05
ADPF	MJ _{NCV}	1050	1780	1980	2670	2510	2730

TABLE 14. ENVIRONMENTAL PARAMETERS (A1-A3), CONCRETE FOR SPECIAL APPLICATIONS, DARLING DOWNS (QLD), PER M³

Parameter	Unit	STABILISED SAND 12:1	KERB MACHINE 280kg	KERB MACHINE 320kg	TMR MTRS 70 / 40 MPa 20mm PUMP B2 EXPOSURE TREMIE B2 EXPOSURE	TMR MTRS 70 / 40 MPa 20mm PUMP B2 EXPOSURE	TMR MTRS 70 / 50 MPa 20mm TREMIE B2 EXPOSURE
PERE	MJ _{NCV}	1.30E+01	2.01E+01	2.24E+01	3.41E+01	2.87E+01	3.71E+01
PERM	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-01
PERT	MJ _{NCV}	1.30E+01	2.01E+01	2.24E+01	3.41E+01	2.87E+01	3.72E+01
PENRE	MJ _{NCV}	1.08E+03	1.83E+03	2.03E+03	2.73E+03	2.57E+03	2.79E+03
PENRM	MJ _{NCV}	0.00E+00	3.82E+00	4.37E+00	1.30E+01	6.31E+00	8.92E+00
PENRT	MJ _{NCV}	1.08E+03	1.83E+03	2.03E+03	2.74E+03	2.57E+03	2.80E+03
SM	kg	3.74E+01	7.28E+01	8.32E+01	1.14E+02	1.09E+02	1.19E+02
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	2.98E+00	3.64E+00	3.62E+00	3.99E+00	4.01E+00	4.05E+00
HWD	kg	0.00E+00	5.92E-06	6.74E-06	2.32E-05	9.30E-06	3.33E-05
NHWD	kg	1.03E-01	6.59E-01	7.41E-01	3.02E+00	9.54E-01	3.53E+00
RWD	kg	0.00E+00	1.13E-03	1.29E-03	4.60E-03	1.77E-03	4.28E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
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

Darling Downs region

TABLE 15. ENVIRONMENTAL PROFILES (A1-A3), CONCRETE FOR SPECIAL APPLICATIONS, DARLING DOWNS (QLD), PER M³

Indicator	Unit	NO FINES 6:1	POST TENSIONED 40 MPa 22@3	POST TENSIONED 40 MPa 22@4	SHOTCRETE 32 MPa
GWP	kg CO ₂ eq	253	394	386	355
ODP	kg CFC11 eq	4.90E-06	7.53E-06	7.42E-06	6.90E-06
AP	kg SO ₂ eq	1.00	1.57	1.54	1.41
EP	kg PO ₄ ³⁻ eq	0.142	0.217	0.213	0.197
POCP	kg C ₂ H ₄ eq	0.0564	0.0884	0.0870	0.0804
ADPE	kg Sb eq	1.06E-06	5.39E-06	5.18E-06	5.03E-06
ADPF	MJ _{NCV}	1710	2630	2580	2390

TABLE 16. ENVIRONMENTAL PARAMETERS (A1-A3), CONCRETE FOR SPECIAL APPLICATIONS, DARLING DOWNS (QLD), PER M³

Parameter	Unit	NO FINES 6:1	POST TENSIONED 40 MPa 22@3	POST TENSIONED 40 MPa 22@4	SHOTCRETE 32 MPa
PERE	MJ _{NCV}	1.90E+01	3.00E+01	2.94E+01	2.81E+01
PERM	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00	2.81E+01
PERT	MJ _{NCV}	1.90E+01	3.00E+01	2.94E+01	0.00E+00
PENRE	MJ _{NCV}	1.75E+03	2.69E+03	2.64E+03	2.81E+01
PENRM	MJ _{NCV}	0.00E+00	5.87E+00	5.60E+00	2.45E+03
PENRT	MJ _{NCV}	1.75E+03	2.70E+03	2.65E+03	5.46E+00
SM	kg	0.00E+00	9.88E+01	8.53E+01	2.45E+03
RSF	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00	1.04E+02
NRSF	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m ³	3.21E+00	4.02E+00	4.05E+00	0.00E+00
HWD	kg	0.00E+00	8.89E-06	8.47E-06	3.82E+00
NHWD	kg	1.46E-01	9.76E-01	9.36E-01	8.27E-06
RWD	kg	0.00E+00	1.70E-03	1.62E-03	9.07E-01
CRU	kg	0.00E+00	0.00E+00	0.00E+00	1.58E-03
MFR	kg	9.60E+01	9.60E+01	9.60E+01	0.00E+00
MER	kg	0.00E+00	0.00E+00	0.00E+00	9.60E+01
EE	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00



Central Queensland region

Environmental profiles and parameters

Product table list

Central Queensland region

In each region, we start with presenting a summary of the carbon footprint (GWP summary) of our concrete mixes.

Lower carbon concrete products

Table No. 1 and 276

- ENVISIA® 20 MPa
- ENVISIA® 25 MPa
- ENVISIA® 32 MPa
- ENVISIA® 40 MPa
- ENVISIA® 50 MPa

Table No. 3 and 477

- ENVIROCRETE® PLUS 20 MPa
- ENVIROCRETE® PLUS 25 MPa
- ENVIROCRETE® PLUS 32 MPa
- ENVIROCRETE® PLUS 40 MPa
- ENVIROCRETE® PLUS 50 MPa

Table No. 5 and 678

- ENVIROCRETE® 20 MPa
- ENVIROCRETE® 25 MPa
- ENVIROCRETE® 32 MPa
- ENVIROCRETE® 40 MPa
- ENVIROCRETE® 50 MPa

Normal class concrete products

Table No. 7 and 879

- NORMAL CLASS GP BLEND 20 MPa
- NORMAL CLASS GP BLEND 25 MPa
- NORMAL CLASS GP BLEND 32 MPa
- NORMAL CLASS GP BLEND 40 MPa
- NORMAL CLASS GP BLEND 50 MPa

Table No. 9 and 10 80

- NORMAL CLASS GP / FA BLEND 20 MPa
- NORMAL CLASS GP / FA BLEND 25 MPa
- NORMAL CLASS GP / FA BLEND 32 MPa
- NORMAL CLASS GP / FA BLEND 40 MPa
- NORMAL CLASS GP / FA BLEND 50 MPa

Concrete for special applications

Table No. 11 and 1281

- HIGH SLUMP 40 MPa
- HIGH SLUMP 50 MPa
- HIGH SLUMP 65 MPa
- HIGH SLUMP 80 MPa

Table No. 13 and 1482

- STABILISED SAND 12:1
- KERB MACHINE 280kg
- KERB MACHINE 320kg
- TMR MTRS 70 / 40 MPa 20mm PUMP B1 EXPOSURE

Table No. 15 and 1683

- NO FINES 6:1
- POST TENSIONED 40 MPa 22@3
- POST TENSIONED 40 MPa 22@4
- SHOTCRETE 32 MPa

Cradle-to-gate GWP summary (kg CO₂ eq / m³)

Central Queensland region

ENVISIA® 20 MPa	ENVISIA® 25 MPa	ENVISIA® 32 MPa	ENVISIA® 40 MPa	ENVISIA® 50 MPa
167	182	202	237	352
ENVIROCRETE® PLUS 20 MPa	ENVIROCRETE® PLUS 25 MPa	ENVIROCRETE® PLUS 32 MPa	ENVIROCRETE® PLUS 40 MPa	ENVIROCRETE® PLUS 50 MPa
174	190	211	247	331
ENVIROCRETE® 20 MPa	ENVIROCRETE® 25 MPa	ENVIROCRETE® 32 MPa	ENVIROCRETE® 40 MPa	ENVIROCRETE® 50 MPa
180	196	218	256	344
NORMAL GP BLEND 20 MPa	NORMAL GP BLEND 25 MPa	NORMAL GP BLEND 32 MPa	NORMAL GP BLEND 40 MPa	NORMAL GP BLEND 50 MPa
292	303	325	396	530
NORMAL GP / FA BLEND 20 MPa	NORMAL GP / FA BLEND 25 MPa	NORMAL GP / FA BLEND 32 MPa	NORMAL GP / FA BLEND 40 MPa	NORMAL GP / FA BLEND 50 MPa
229	251	280	331	445
HIGH SLUMP 40 MPa	HIGH SLUMP 50 MPa	HIGH SLUMP 65 MPa	HIGH SLUMP 80 MPa	
368	440	464	588	
STABILISED SAND 12:1	KERB MACHINE 280kg	KERB MACHINE 320kg	TMR MTRS 70 / 40 MPa 20mm PUMP B1 EXPOSURE	
139	273	306	366	
NO FINES 6:1	POST TENSIONED 40 MPa 22@3	POST TENSIONED 40 MPa 22@4	SHOTCRETE 32 MPa	
244	411	349	379	

Central Queensland region

TABLE 1. ENVIRONMENTAL PROFILES (A1-A3), LOWER CARBON CONCRETE, CENTRAL QUEENSLAND, PER M³

Indicator	Unit	ENVISIA® 20 MPa	ENVISIA® 25 MPa	ENVISIA® 32 MPa	ENVISIA® 40 MPa	ENVISIA® 50 MPa
GWP	kg CO₂ eq	167	182	202	237	352
ODP	kg CFC11 eq	6.07E-06	6.44E-06	6.96E-06	7.83E-06	1.08E-05
AP	kg SO ₂ eq	0.896	0.975	1.09	1.28	1.90
EP	kg PO ₄ ³⁻ eq	0.115	0.123	0.136	0.158	0.229
POCP	kg C ₂ H ₄ eq	0.0617	0.0660	0.0720	0.0821	0.116
ADPE	kg Sb eq	4.50E-06	4.92E-06	5.51E-06	6.48E-06	9.15E-06
ADPF	MJ _{NCV}	1500	1620	1790	2070	3020

TABLE 2. ENVIRONMENTAL PARAMETERS (A1-A3), LOWER CARBON CONCRETE, CENTRAL QUEENSLAND, PER M³

Parameter	Unit	ENVISIA® 20 MPa	ENVISIA® 25 MPa	ENVISIA® 32 MPa	ENVISIA® 40 MPa	ENVISIA® 50 MPa
PERE	MJ _{NCV}	1.91E+01	2.07E+01	2.31E+01	2.70E+01	4.00E+01
PERM	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ _{NCV}	1.91E+01	2.07E+01	2.31E+01	2.70E+01	4.00E+01
PENRE	MJ _{NCV}	1.55E+03	1.67E+03	1.85E+03	2.14E+03	3.11E+03
PENRM	MJ _{NCV}	3.93E+00	4.34E+00	4.92E+00	5.90E+00	9.73E+00
PENRT	MJ _{NCV}	1.56E+03	1.68E+03	1.85E+03	2.14E+03	3.12E+03
SM	kg	1.50E+02	1.65E+02	1.87E+02	2.25E+02	3.46E+02
RSF	MJ _{NCV}	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
FW	m ³	3.62E+00	3.63E+00	3.64E+00	3.67E+00	3.79E+00
HWD	kg	7.53E-06	8.23E-06	9.17E-06	1.06E-05	1.56E-05
NHWD	kg	9.07E-01	9.97E-01	1.12E+00	1.33E+00	1.84E+00
RWD	kg	1.44E-03	1.58E-03	1.77E-03	2.05E-03	3.04E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.04E-03
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	0.00E+00
MER	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.60E+01
EE	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Central Queensland region

TABLE 3. ENVIRONMENTAL PROFILES (A1-A3), LOWER CARBON CONCRETE, CENTRAL QUEENSLAND, PER M³

Indicator	Unit	ENVIROCRETE® PLUS 20 MPa	ENVIROCRETE® PLUS 25 MPa	ENVIROCRETE® PLUS 32 MPa	ENVIROCRETE® PLUS 40 MPa	ENVIROCRETE® PLUS 50 MPa
GWP	kg CO ₂ eq	174	190	211	247	331
ODP	kg CFC11 eq	5.99E-06	6.37E-06	6.90E-06	7.71E-06	9.70E-06
AP	kg SO ₂ eq	0.872	0.954	1.06	1.24	1.66
EP	kg PO ₄ ³⁻ eq	0.115	0.125	0.137	0.158	0.208
POCP	kg C ₂ H ₄ eq	0.0615	0.0660	0.0721	0.0819	0.106
ADPE	kg Sb eq	9.91E-06	1.09E-05	1.23E-05	1.47E-05	2.04E-05
ADPF	MJ _{NCV}	1490	1620	1790	2070	2730

TABLE 4. ENVIRONMENTAL PARAMETERS (A1-A3), LOWER CARBON CONCRETE, CENTRAL QUEENSLAND, PER M³

Parameter	Unit	ENVIROCRETE® PLUS 20 MPa	ENVIROCRETE® PLUS 25 MPa	ENVIROCRETE® PLUS 32 MPa	ENVIROCRETE® PLUS 40 MPa	ENVIROCRETE® PLUS 50 MPa
PERE	MJ _{NCV}	1.93E+01	2.11E+01	2.34E+01	2.75E+01	3.74E+01
PERM	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ _{NCV}	1.93E+01	2.11E+01	2.34E+01	2.75E+01	3.74E+01
PENRE	MJ _{NCV}	1.55E+03	1.67E+03	1.84E+03	2.13E+03	2.81E+03
PENRM	MJ _{NCV}	4.72E+00	5.21E+00	5.90E+00	7.08E+00	1.12E+01
PENRT	MJ _{NCV}	1.55E+03	1.68E+03	1.85E+03	2.14E+03	2.82E+03
SM	kg	1.37E+02	1.52E+02	1.77E+02	2.06E+02	2.83E+02
RSF	MJ _{NCV}	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
FW	m ³	3.61E+00	3.63E+00	3.64E+00	3.67E+00	3.69E+00
HWD	kg	1.26E-05	1.40E-05	1.58E-05	1.90E-05	2.76E-05
NHWD	kg	2.41E+00	2.66E+00	3.01E+00	3.60E+00	4.94E+00
RWD	kg	2.66E-03	2.93E-03	3.32E-03	3.98E-03	5.75E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Central Queensland region

TABLE 5. ENVIRONMENTAL PROFILES (A1-A3), LOWER CARBON CONCRETE, CENTRAL QUEENSLAND, PER M³

Indicator	Unit	ENVIROCRETE® 20 MPa	ENVIROCRETE® 25 MPa	ENVIROCRETE® 32 MPa	ENVIROCRETE® 40 MPa	ENVIROCRETE® 50 MPa
GWP	kg CO₂ eq	180	196	218	256	344
ODP	kg CFC11 eq	5.98E-06	6.34E-06	6.84E-06	7.68E-06	9.67E-06
AP	kg SO ₂ eq	0.857	0.935	1.04	1.22	1.63
EP	kg PO ₄ ³⁻ eq	0.116	0.126	0.138	0.160	0.211
POCP	kg C ₂ H ₄ eq	0.0611	0.0653	0.0712	0.0811	0.104
ADPE	kg Sb eq	4.45E-06	4.87E-06	5.45E-06	6.41E-06	8.94E-06
ADPF	MJ _{NCV}	1480	1600	1760	2040	2680

TABLE 6. ENVIRONMENTAL PARAMETERS (A1-A3), LOWER CARBON CONCRETE, CENTRAL QUEENSLAND, PER M³

Parameter	Unit	ENVIROCRETE® 20 MPa	ENVIROCRETE® 25 MPa	ENVIROCRETE® 32 MPa	ENVIROCRETE® 40 MPa	ENVIROCRETE® 50 MPa
PERE	MJ_{NCV}	1.68E+01	1.83E+01	2.02E+01	2.35E+01	3.17E+01
PERM	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ _{NCV}	1.68E+01	1.83E+01	2.02E+01	2.35E+01	3.17E+01
PENRE	MJ_{NCV}	1.53E+03	1.65E+03	1.82E+03	2.10E+03	2.77E+03
PENRM	MJ _{NCV}	3.93E+00	4.34E+00	4.92E+00	5.90E+00	9.73E+00
PENRT	MJ _{NCV}	1.53E+03	1.66E+03	1.82E+03	2.11E+03	2.78E+03
SM	kg	1.25E+02	1.37E+02	1.56E+02	1.87E+02	2.57E+02
RSF	MJ _{NCV}	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
FW	m³	3.62E+00	3.64E+00	3.65E+00	3.68E+00	3.70E+00
HWD	kg	7.53E-06	8.23E-06	9.17E-06	1.06E-05	1.56E-05
NHWD	kg	8.83E-01	9.71E-01	1.09E+00	1.30E+00	1.77E+00
RWD	kg	1.44E-03	1.58E-03	1.77E-03	2.05E-03	3.04E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Central Queensland region

TABLE 7. ENVIRONMENTAL PROFILES (A1-A3), NORMAL CLASS CONCRETE, CENTRAL QUEENSLAND, PER M³

Indicator	Unit	NORMAL CLASS GP BLEND 20 MPa	NORMAL CLASS GP BLEND 25 MPa	NORMAL CLASS GP BLEND 32 MPa	NORMAL CLASS GP BLEND 40 MPa	NORMAL CLASS GP BLEND 50 MPa
GWP	kg CO₂ eq	292	303	325	396	530
ODP	kg CFC11 eq	6.91E-06	7.07E-06	7.43E-06	8.60E-06	1.08E-05
AP	kg SO ₂ eq	1.18	1.23	1.31	1.60	2.12
EP	kg PO ₄ ³⁻ eq	0.166	0.172	0.184	0.221	0.291
POCP	kg C ₂ H ₄ eq	0.0760	0.0781	0.0827	0.0976	0.126
ADPE	kg Sb eq	4.70E-06	5.10E-06	5.68E-06	6.72E-06	9.34E-06
ADPF	MJ _{NCV}	2020	2090	2230	2680	3530

TABLE 8. ENVIRONMENTAL PARAMETERS (A1-A3), NORMAL CLASS CONCRETE, CENTRAL QUEENSLAND, PER M³

Parameter	Unit	NORMAL CLASS GP BLEND 20 MPa	NORMAL CLASS GP BLEND 25 MPa	NORMAL CLASS GP BLEND 32 MPa	NORMAL CLASS GP BLEND 40 MPa	NORMAL CLASS GP BLEND 50 MPa
PERE	MJ _{NCV}	2.14E+01	2.23E+01	2.39E+01	2.87E+01	3.85E+01
PERM	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ _{NCV}	2.14E+01	2.23E+01	2.39E+01	2.87E+01	3.85E+01
PENRE	MJ _{NCV}	2.08E+03	2.15E+03	2.29E+03	2.75E+03	3.62E+03
PENRM	MJ _{NCV}	3.93E+00	4.34E+00	4.92E+00	5.90E+00	9.73E+00
PENRT	MJ _{NCV}	2.09E+03	2.16E+03	2.30E+03	2.76E+03	3.63E+03
SM	kg	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
NRSF	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m ³	3.94E+00	3.94E+00	3.96E+00	4.09E+00	4.24E+00
HWD	kg	7.53E-06	8.23E-06	9.17E-06	1.06E-05	1.56E-05
NHWD	kg	8.83E-01	9.67E-01	1.09E+00	1.29E+00	1.76E+00
RWD	kg	1.44E-03	1.58E-03	1.77E-03	2.05E-03	3.04E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Central Queensland region

TABLE 9. ENVIRONMENTAL PROFILES (A1-A3), NORMAL CLASS CONCRETE, CENTRAL QUEENSLAND, PER M³

Indicator	Unit	NORMAL CLASS GP / FA BLEND 20 MPa	NORMAL CLASS GP / FA BLEND 25 MPa	NORMAL CLASS GP / FA BLEND 32 MPa	NORMAL CLASS GP / FA BLEND 40 MPa	NORMAL CLASS GP / FA BLEND 50 MPa
GWP	kg CO₂ eq	229	251	280	331	445
ODP	kg CFC11 eq	6.26E-06	6.65E-06	7.19E-06	8.11E-06	1.02E-05
AP	kg SO ₂ eq	0.940	1.02	1.14	1.34	1.79
EP	kg PO ₄ ³⁻ eq	0.135	0.147	0.162	0.189	0.249
POCP	kg C ₂ H ₄ eq	0.0661	0.0708	0.0774	0.0886	0.115
ADPE	kg Sb eq	4.54E-06	4.97E-06	5.56E-06	6.54E-06	9.12E-06
ADPF	MJ _{NCV}	1660	1800	1990	2310	3060

TABLE 10. ENVIRONMENTAL PARAMETERS (A1-A3), NORMAL CLASS CONCRETE, CENTRAL QUEENSLAND, PER M³

Parameter	Unit	NORMAL CLASS GP / FA BLEND 20 MPa	NORMAL CLASS GP / FA BLEND 25 MPa	NORMAL CLASS GP / FA BLEND 32 MPa	NORMAL CLASS GP / FA BLEND 40 MPa	NORMAL CLASS GP / FA BLEND 50 MPa
PERE	MJ _{NCV}	1.73E+01	1.88E+01	2.09E+01	2.44E+01	3.28E+01
PERM	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ _{NCV}	1.73E+01	1.88E+01	2.09E+01	2.44E+01	3.28E+01
PENRE	MJ _{NCV}	1.71E+03	1.85E+03	2.05E+03	2.38E+03	3.14E+03
PENRM	MJ _{NCV}	3.93E+00	4.34E+00	4.92E+00	5.90E+00	9.73E+00
PENRT	MJ _{NCV}	1.72E+03	1.86E+03	2.05E+03	2.38E+03	3.15E+03
SM	kg	6.24E+01	6.86E+01	7.80E+01	9.36E+01	1.29E+02
RSF	MJ _{NCV}	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
FW	m ³	3.76E+00	3.79E+00	3.83E+00	3.90E+00	4.00E+00
HWD	kg	7.53E-06	8.23E-06	9.17E-06	1.06E-05	1.56E-05
NHWD	kg	8.70E-01	9.56E-01	1.08E+00	1.28E+00	1.75E+00
RWD	kg	1.44E-03	1.58E-03	1.77E-03	2.05E-03	3.04E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Central Queensland region

TABLE 11. ENVIRONMENTAL PROFILES (A1-A3), CONCRETE FOR SPECIAL APPLICATIONS, CENTRAL QUEENSLAND, PER M³

Indicator	Unit	HIGH SLUMP 40 MPa	HIGH SLUMP 50 MPa	HIGH SLUMP 65 MPa	HIGH SLUMP 80 MPa
GWP	kg CO₂ eq	368	440	464	588
ODP	kg CFC11 eq	8.63E-06	9.50E-06	1.04E-05	1.23E-05
AP	kg SO ₂ eq	1.48	1.76	1.89	2.39
EP	kg PO ₄ ³⁻ eq	0.208	0.244	0.259	0.322
POCP	kg C ₂ H ₄ eq	0.0961	0.108	0.119	0.145
ADPE	kg Sb eq	1.03E-05	5.17E-06	2.09E-05	3.73E-05
ADPF	MJ _{NCV}	2590	3000	3180	4000

TABLE 12. ENVIRONMENTAL PARAMETERS (A1-A3), CONCRETE FOR SPECIAL APPLICATIONS, CENTRAL QUEENSLAND, PER M³

Parameter	Unit	HIGH SLUMP 40 MPa	HIGH SLUMP 50 MPa	HIGH SLUMP 65 MPa	HIGH SLUMP 80 MPa
PERE	MJ _{NCV}	3.04E+01	3.33E+01	3.67E+01	5.04E+01
PERM	MJ _{NCV}	0.00E+00	0.00E+00	2.48E-02	4.40E-02
PERT	MJ _{NCV}	3.04E+01	3.33E+01	3.68E+01	5.04E+01
PENRE	MJ _{NCV}	2.65E+03	3.07E+03	3.27E+03	4.10E+03
PENRM	MJ _{NCV}	1.75E+01	1.47E+01	1.84E+00	3.26E+00
PENRT	MJ _{NCV}	2.67E+03	3.09E+03	3.27E+03	4.10E+03
SM	kg	1.04E+02	1.04E+02	9.36E+01	8.32E+01
RSF	MJ _{NCV}	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
FW	m ³	3.97E+00	3.96E+00	4.02E+00	4.28E+00
HWD	kg	2.36E-05	1.86E-05	2.23E-05	4.05E-05
NHWD	kg	1.65E+00	2.28E-01	5.47E+00	9.90E+00
RWD	kg	4.39E-03	3.16E-03	4.50E-03	8.18E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Central Queensland region

TABLE 13. ENVIRONMENTAL PROFILES (A1-A3), CONCRETE FOR SPECIAL APPLICATIONS, CENTRAL QUEENSLAND, PER M³

Indicator	Unit	STABILISED SAND 12:1	KERB MACHINE 280kg	KERB MACHINE 320kg	TMR MTRS 70 / 40 MPa 20mm PUMP B1 EXPOSURE
GWP	kg CO₂ eq	139	273	306	366
ODP	kg CFC11 eq	4.29E-06	7.33E-06	7.89E-06	8.81E-06
AP	kg SO ₂ eq	0.575	1.12	1.25	1.48
EP	kg PO ₄ ³⁻ eq	0.085	0.159	0.177	0.208
POCP	kg C ₂ H ₄ eq	0.0434	0.0779	0.0850	0.0969
ADPE	kg Sb eq	5.37E-07	5.29E-06	5.98E-06	7.52E-06
ADPF	MJ _{NCV}	1020	1960	2170	2540

TABLE 14. ENVIRONMENTAL PARAMETERS (A1-A3), CONCRETE FOR SPECIAL APPLICATIONS, CENTRAL QUEENSLAND, PER M³

Parameter	Unit	STABILISED SAND 12:1	KERB MACHINE 280kg	KERB MACHINE 320kg	TMR MTRS 70 / 40 MPa 20mm PUMP B1 EXPOSURE
PERE	MJ _{NCV}	9.00E+00	2.03E+01	2.27E+01	2.71E+01
PERM	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ _{NCV}	9.00E+00	2.03E+01	2.27E+01	2.71E+01
PENRE	MJ _{NCV}	1.06E+03	2.02E+03	2.24E+03	2.62E+03
PENRM	MJ _{NCV}	0.00E+00	4.75E+00	5.41E+00	8.20E+00
PENRT	MJ _{NCV}	1.06E+03	2.03E+03	2.24E+03	2.63E+03
SM	kg	4.68E+01	7.59E+01	8.63E+01	1.04E+02
RSF	MJ _{NCV}	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
FW	m ³	2.53E+00	3.75E+00	3.80E+00	3.95E+00
HWD	kg	0.00E+00	8.67E-06	9.80E-06	1.30E-05
NHWD	kg	5.74E-02	1.04E+00	1.17E+00	1.42E+00
RWD	kg	0.00E+00	1.68E-03	1.90E-03	2.52E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Central Queensland region

TABLE 15. ENVIRONMENTAL PROFILES (A1-A3), CONCRETE FOR SPECIAL APPLICATIONS, CENTRAL QUEENSLAND, PER M³

Indicator	Unit	NO FINES 6:1	POST TENSIONED 40 MPa 22@3	POST TENSIONED 40 MPa 22@4	SHOTCRETE 32 MPa
GWP	kg CO₂ eq	244	411	349	379
ODP	kg CFC11 eq	4.84E-06	9.26E-06	8.64E-06	8.70E-06
AP	kg SO ₂ eq	0.980	1.66	1.42	1.53
EP	kg PO ₄ ³⁻ eq	0.135	0.230	0.199	0.213
POCP	kg C ₂ H ₄ eq	0.0558	0.104	0.0942	0.0972
ADPE	kg Sb eq	9.58E-07	7.71E-06	6.79E-06	7.55E-06
ADPF	MJ _{NCV}	1610	2800	2440	2610

TABLE 16. ENVIRONMENTAL PARAMETERS (A1-A3), CONCRETE FOR SPECIAL APPLICATIONS, CENTRAL QUEENSLAND, PER M³

Parameter	Unit	NO FINES 6:1	POST TENSIONED 40 MPa 22@3	POST TENSIONED 40 MPa 22@4	SHOTCRETE 32 MPa
PERE	MJ _{NCV}	1.65E+01	3.00E+01	2.55E+01	2.81E+01
PERM	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ _{NCV}	1.65E+01	3.00E+01	2.55E+01	2.81E+01
PENRE	MJ _{NCV}	1.65E+03	2.88E+03	2.51E+03	2.68E+03
PENRM	MJ _{NCV}	0.00E+00	7.05E+00	6.23E+00	6.88E+00
PENRT	MJ _{NCV}	1.65E+03	2.89E+03	2.52E+03	2.68E+03
SM	kg	0.00E+00	8.94E+01	9.88E+01	1.09E+02
RSF	MJ _{NCV}	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
FW	m ³	3.07E+00	3.97E+00	3.97E+00	3.87E+00
HWD	kg	0.00E+00	1.21E-05	1.07E-05	1.23E-05
NHWD	kg	9.02E-02	1.52E+00	1.34E+00	1.48E+00
RWD	kg	0.00E+00	2.38E-03	2.10E-03	2.40E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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



Townsville region

Environmental profiles and parameters

Product table list

Townsville region

In each region, we start with presenting a summary of the carbon footprint (GWP summary) of our concrete mixes.

Lower carbon concrete products

Table No. 1 and 287

- ENVISIA® 20 MPa
- ENVISIA® 25 MPa
- ENVISIA® 32 MPa
- ENVISIA® 40 MPa
- ENVISIA® 50 MPa

Table No. 3 and 488

- ENVIROCRETE® PLUS 20 MPa
- ENVIROCRETE® PLUS 25 MPa
- ENVIROCRETE® PLUS 32 MPa
- ENVIROCRETE® PLUS 40 MPa
- ENVIROCRETE® PLUS 50 MPa

Table No. 5 and 689

- ENVIROCRETE® 20 MPa
- ENVIROCRETE® 25 MPa
- ENVIROCRETE® 32 MPa
- ENVIROCRETE® 40 MPa
- ENVIROCRETE® 50 MPa

Normal class concrete products

Table No. 7 and 890

- NORMAL CLASS GP BLEND 20 MPa
- NORMAL CLASS GP BLEND 25 MPa
- NORMAL CLASS GP BLEND 32 MPa
- NORMAL CLASS GP BLEND 40 MPa
- NORMAL CLASS GP BLEND 50 MPa

Table No. 9 and 1091

- NORMAL CLASS GP / FA BLEND 20 MPa
- NORMAL CLASS GP / FA BLEND 25 MPa
- NORMAL CLASS GP / FA BLEND 32 MPa
- NORMAL CLASS GP / FA BLEND 40 MPa
- NORMAL CLASS GP / FA BLEND 50 MPa

Concrete for special applications

Table No. 11 and 1292

- HIGH SLUMP 40 MPa
- HIGH SLUMP 50 MPa
- HIGH SLUMP 65 MPa
- HIGH SLUMP 80 MPa

Table No. 13 and 1493

- STABILISED SAND 12:1
- KERB MACHINE 280kg
- KERB MACHINE 320kg
- TMR MTRS 70 / 40 MPa 20mm PUMP B2 EXPOSURE
- TMR MTRS 70 / 40 MPa 20mm PUMP B2 EXPOSURE TREMIE B2 EXPOSURE
- TMR MTRS 70 / 50 MPa 20mm TREMIE B2 EXPOSURE

Table No. 15 and 1694

- NO FINES 6:1
- POST TENSIONED 40 MPa 22@3
- POST TENSIONED 40 MPa 22@4
- SHOTCRETE 32 MPa

Cradle-to-gate GWP Summary (kg CO₂ eq / m³)

Townsville region

ENVISIA® 20 MPa	ENVISIA® 25 MPa	ENVISIA® 32 MPa	ENVISIA® 40 MPa	ENVISIA® 50 MPa	
164	180	196	244	296	
ENVIROCRETE® PLUS 20 MPa	ENVIROCRETE® PLUS 25 MPa	ENVIROCRETE® PLUS 32 MPa	ENVIROCRETE® PLUS 40 MPa	ENVIROCRETE® PLUS 50 MPa	
169	183	191	234	280	
ENVIROCRETE® 20 MPa	ENVIROCRETE® 25 MPa	ENVIROCRETE® 32 MPa	ENVIROCRETE® 40 MPa	ENVIROCRETE® 50 MPa	
172	189	197	240	288	
NORMAL GP BLEND 20 MPa	NORMAL GP BLEND 25 MPa	NORMAL GP BLEND 32 MPa	NORMAL GP BLEND 40 MPa	NORMAL GP BLEND 50 MPa	
265	290	328	372	464	
NORMAL GP / FA BLEND 20 MPa	NORMAL GP / FA BLEND 25 MPa	NORMAL GP / FA BLEND 32 MPa	NORMAL GP / FA BLEND 40 MPa	NORMAL GP / FA BLEND 50 MPa	
215	236	247	304	367	
HIGH SLUMP 40 MPa	HIGH SLUMP 50 MPa	HIGH SLUMP 65 MPa	HIGH SLUMP 80 MPa		
294	325	336	513		
STABILISED SAND 12:1	KERB MACHINE 280kg	KERB MACHINE 320kg	TMR MTRS 70 / 40 MPa 20mm PUMP B2 EXPOSURE TREMIE B2 EXPOSURE	TMR MTRS 70 / 40 MPa 20mm PUMP B2 EXPOSURE	TMR MTRS 70 / 50 MPa 20mm TREMIE B2 EXPOSURE
121	254	281	313	328	365
NO FINES 6:1	POST TENSIONED 40 MPa 22@3	POST TENSIONED 40 MPa 22@4	SHOTCRETE 32 MPa		
224	339	310	330		

Townsville region

TABLE 1. ENVIRONMENTAL PROFILES (A1-A3), LOWER CARBON CONCRETE, TOWNSVILLE (QLD), PER M³

Indicator	Unit	ENVISIA® 20 MPa	ENVISIA® 25 MPa	ENVISIA® 32 MPa	ENVISIA® 40 MPa	ENVISIA® 50 MPa
GWP	kg CO₂ eq	164	180	196	244	296
ODP	kg CFC11 eq	5.17E-06	5.45E-06	5.74E-06	6.61E-06	7.54E-06
AP	kg SO ₂ eq	0.723	0.791	0.859	1.06	1.29
EP	kg PO ₄ ³⁻ eq	0.109	0.118	0.128	0.155	0.185
POCP	kg C ₂ H ₄ eq	0.0511	0.0545	0.0579	0.0683	0.0797
ADPE	kg Sb eq	4.55E-06	5.03E-06	5.29E-06	6.51E-06	8.59E-06
ADPF	MJ _{NCV}	1460	1590	1710	2090	2510

TABLE 2. ENVIRONMENTAL PARAMETERS (A1-A3), LOWER CARBON CONCRETE, TOWNSVILLE (QLD), PER M³

Parameter	Unit	ENVISIA® 20 MPa	ENVISIA® 25 MPa	ENVISIA® 32 MPa	ENVISIA® 40 MPa	ENVISIA® 50 MPa
PERE	MJ _{NCV}	2.22E+01	2.43E+01	2.63E+01	3.24E+01	3.95E+01
PERM	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ _{NCV}	2.22E+01	2.43E+01	2.63E+01	3.24E+01	3.95E+01
PENRE	MJ _{NCV}	1.51E+03	1.63E+03	1.76E+03	2.14E+03	2.57E+03
PENRM	MJ _{NCV}	8.10E+00	9.09E+00	9.59E+00	1.21E+01	1.49E+01
PENRT	MJ _{NCV}	1.52E+03	1.64E+03	1.77E+03	2.16E+03	2.58E+03
SM	kg	1.56E+02	1.75E+02	1.93E+02	2.50E+02	3.12E+02
RSF	MJ _{NCV}	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
FW	m ³	3.14E+00	3.14E+00	3.16E+00	3.18E+00	3.18E+00
HWD	kg	1.02E-05	1.14E-05	1.20E-05	1.51E-05	1.93E-05
NHWD	kg	6.57E-01	7.30E-01	7.73E-01	9.62E-01	1.38E+00
RWD	kg	1.86E-03	2.09E-03	2.20E-03	2.77E-03	3.57E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Townsville region

TABLE 3. ENVIRONMENTAL PROFILES (A1-A3), LOWER CARBON CONCRETE, TOWNSVILLE (QLD), PER M³

Indicator	Unit	ENVIROCRETE® PLUS 20 MPa	ENVIROCRETE® PLUS 25 MPa	ENVIROCRETE® PLUS 32 MPa	ENVIROCRETE® PLUS 40 MPa	ENVIROCRETE® PLUS 50 MPa
GWP	kg CO₂ eq	169	183	191	234	280
ODP	kg CFC11 eq	4.94E-06	5.15E-06	5.28E-06	5.95E-06	6.66E-06
AP	kg SO ₂ eq	0.666	0.721	0.749	0.908	1.08
EP	kg PO ₄ ³⁻ eq	0.108	0.116	0.120	0.143	0.169
POCP	kg C ₂ H ₄ eq	0.0481	0.0508	0.0522	0.0603	0.0692
ADPE	kg Sb eq	8.02E-06	8.91E-06	9.36E-06	1.16E-05	1.63E-05
ADPF	MJ _{NCV}	1430	1540	1600	1920	2270

TABLE 4. ENVIRONMENTAL PARAMETERS (A1-A3), LOWER CARBON CONCRETE, TOWNSVILLE (QLD), PER M³

Parameter	Unit	ENVIROCRETE® PLUS 20 MPa	ENVIROCRETE® PLUS 25 MPa	ENVIROCRETE® PLUS 32 MPa	ENVIROCRETE® PLUS 40 MPa	ENVIROCRETE® PLUS 50 MPa
PERE	MJ _{NCV}	2.21E+01	2.40E+01	2.50E+01	3.04E+01	3.71E+01
PERM	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ _{NCV}	2.21E+01	2.40E+01	2.50E+01	3.04E+01	3.71E+01
PENRE	MJ _{NCV}	1.48E+03	1.59E+03	1.64E+03	1.97E+03	2.32E+03
PENRM	MJ _{NCV}	9.71E+00	1.09E+01	1.15E+01	1.45E+01	1.79E+01
PENRT	MJ _{NCV}	1.49E+03	1.60E+03	1.65E+03	1.98E+03	2.34E+03
SM	kg	1.42E+02	1.57E+02	1.66E+02	2.09E+02	2.58E+02
RSF	MJ _{NCV}	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
FW	m ³	3.11E+00	3.11E+00	3.11E+00	3.11E+00	3.09E+00
HWD	kg	1.48E-05	1.67E-05	1.76E-05	2.21E-05	2.93E-05
NHWD	kg	1.54E+00	1.72E+00	1.81E+00	2.27E+00	3.39E+00
RWD	kg	2.85E-03	3.20E-03	3.37E-03	4.25E-03	5.71E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Townsville region

TABLE 5. ENVIRONMENTAL PROFILES (A1-A3), LOWER CARBON CONCRETE, TOWNSVILLE (QLD), PER M³

Indicator	Unit	ENVIROCRETE® 20 MPa	ENVIROCRETE® 25 MPa	ENVIROCRETE® 32 MPa	ENVIROCRETE® 40 MPa	ENVIROCRETE® 50 MPa
GWP	kg CO₂ eq	172	189	197	240	288
ODP	kg CFC11 eq	4.72E-06	4.95E-06	5.06E-06	5.67E-06	6.31E-06
AP	kg SO ₂ eq	0.617	0.675	0.700	0.846	1.00
EP	kg PO ₄ ³⁻ eq	0.106	0.115	0.120	0.142	0.167
POCP	kg C ₂ H ₄ eq	0.0450	0.0477	0.0490	0.0561	0.0639
ADPE	kg Sb eq	4.48E-06	4.95E-06	5.19E-06	6.36E-06	8.39E-06
ADPF	MJ _{NCV}	1380	1500	1560	1860	2190

TABLE 6. ENVIRONMENTAL PARAMETERS (A1-A3), LOWER CARBON CONCRETE, TOWNSVILLE (QLD), PER M³

Parameter	Unit	ENVIROCRETE® 20 MPa	ENVIROCRETE® 25 MPa	ENVIROCRETE® 32 MPa	ENVIROCRETE® 40 MPa	ENVIROCRETE® 50 MPa
PERE	MJ _{NCV}	1.96E+01	2.15E+01	2.23E+01	2.70E+01	3.23E+01
PERM	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ _{NCV}	1.96E+01	2.15E+01	2.23E+01	2.70E+01	3.23E+01
PENRE	MJ _{NCV}	1.42E+03	1.54E+03	1.60E+03	1.91E+03	2.24E+03
PENRM	MJ _{NCV}	8.10E+00	9.09E+00	9.59E+00	1.21E+01	1.49E+01
PENRT	MJ _{NCV}	1.43E+03	1.55E+03	1.61E+03	1.92E+03	2.26E+03
SM	kg	1.27E+02	1.42E+02	1.51E+02	1.89E+02	2.34E+02
RSF	MJ _{NCV}	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
FW	m ³	3.09E+00	3.09E+00	3.09E+00	3.09E+00	3.06E+00
HWD	kg	1.02E-05	1.14E-05	1.20E-05	1.51E-05	1.93E-05
NHWD	kg	6.38E-01	7.08E-01	7.43E-01	9.21E-01	1.33E+00
RWD	kg	1.86E-03	2.09E-03	2.20E-03	2.77E-03	3.57E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Townsville region

TABLE 7. ENVIRONMENTAL PROFILES (A1-A3), NORMAL CLASS CONCRETE, TOWNSVILLE (QLD), PER M³

Indicator	Unit	NORMAL CLASS GP BLEND 20 MPa	NORMAL CLASS GP BLEND 25 MPa	NORMAL CLASS GP BLEND 32 MPa	NORMAL CLASS GP BLEND 40 MPa	NORMAL CLASS GP BLEND 50 MPa
GWP	kg CO₂ eq	265	290	328	372	464
ODP	kg CFC11 eq	4.48E-06	4.65E-06	4.95E-06	5.26E-06	5.91E-06
AP	kg SO ₂ eq	0.666	0.719	0.803	0.900	1.10
EP	kg PO ₄ ³⁻ eq	0.137	0.148	0.165	0.185	0.225
POCP	kg C ₂ H ₄ eq	0.0448	0.0471	0.0508	0.0551	0.0638
ADPE	kg Sb eq	4.66E-06	5.14E-06	5.44E-06	6.60E-06	8.72E-06
ADPF	MJ _{NCV}	1760	1900	2120	2370	2900

TABLE 8. ENVIRONMENTAL PARAMETERS (A1-A3), NORMAL CLASS CONCRETE, TOWNSVILLE (QLD), PER M³

Parameter	Unit	NORMAL CLASS GP BLEND 20 MPa	NORMAL CLASS GP BLEND 25 MPa	NORMAL CLASS GP BLEND 32 MPa	NORMAL CLASS GP BLEND 40 MPa	NORMAL CLASS GP BLEND 50 MPa
PERE	MJ _{NCV}	2.41E+01	2.62E+01	2.92E+01	3.31E+01	4.09E+01
PERM	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ _{NCV}	2.41E+01	2.62E+01	2.92E+01	3.31E+01	4.09E+01
PENRE	MJ _{NCV}	1.79E+03	1.94E+03	2.16E+03	2.42E+03	2.95E+03
PENRM	MJ _{NCV}	8.10E+00	9.09E+00	9.59E+00	1.21E+01	1.49E+01
PENRT	MJ _{NCV}	1.80E+03	1.94E+03	2.17E+03	2.43E+03	2.97E+03
SM	kg	2.13E-03	2.36E-03	2.71E-03	3.11E-03	3.96E-03
RSF	MJ _{NCV}	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
FW	m ³	3.18E+00	3.18E+00	3.21E+00	3.20E+00	3.22E+00
HWD	kg	1.02E-05	1.14E-05	1.20E-05	1.51E-05	1.93E-05
NHWD	kg	6.71E-01	7.44E-01	7.94E-01	9.67E-01	1.39E+00
RWD	kg	1.86E-03	2.09E-03	2.20E-03	2.77E-03	3.57E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Townsville region

TABLE 9. ENVIRONMENTAL PROFILES (A1-A3), NORMAL CLASS CONCRETE, TOWNSVILLE (QLD), PER M³

Indicator	Unit	NORMAL CLASS GP / FA BLEND 20 MPa	NORMAL CLASS GP / FA BLEND 25 MPa	NORMAL CLASS GP / FA BLEND 32 MPa	NORMAL CLASS GP / FA BLEND 40 MPa	NORMAL CLASS GP / FA BLEND 50 MPa
GWP	kg CO ₂ eq	215	236	247	304	367
ODP	kg CFC11 eq	4.44E-06	4.64E-06	4.74E-06	5.26E-06	5.81E-06
AP	kg SO ₂ eq	0.569	0.619	0.644	0.772	0.915
EP	kg PO ₄ ³⁻ eq	0.117	0.127	0.133	0.159	0.188
POCP	kg C ₂ H ₄ eq	0.0415	0.0438	0.0449	0.0509	0.0575
ADPE	kg Sb eq	4.54E-06	5.01E-06	5.25E-06	6.44E-06	8.49E-06
ADPF	MJ _{NCV}	1490	1620	1690	2020	2400

TABLE 10. ENVIRONMENTAL PARAMETERS (A1-A3), NORMAL CLASS CONCRETE, TOWNSVILLE (QLD), PER M³

Parameter	Unit	NORMAL CLASS GP / FA BLEND 20 MPa	NORMAL CLASS GP / FA BLEND 25 MPa	NORMAL CLASS GP / FA BLEND 32 MPa	NORMAL CLASS GP / FA BLEND 40 MPa	NORMAL CLASS GP / FA BLEND 50 MPa
PERE	MJ _{NCV}	2.03E+01	2.21E+01	2.31E+01	2.79E+01	3.35E+01
PERM	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ _{NCV}	2.03E+01	2.21E+01	2.31E+01	2.79E+01	3.35E+01
PENRE	MJ _{NCV}	1.53E+03	1.66E+03	1.73E+03	2.06E+03	2.44E+03
PENRM	MJ _{NCV}	8.10E+00	9.09E+00	9.59E+00	1.21E+01	1.49E+01
PENRT	MJ _{NCV}	1.54E+03	1.67E+03	1.74E+03	2.08E+03	2.46E+03
SM	kg	6.34E+01	7.18E+01	7.59E+01	9.46E+01	1.16E+02
RSF	MJ _{NCV}	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
FW	m ³	3.12E+00	3.12E+00	3.12E+00	3.13E+00	3.11E+00
HWD	kg	1.02E-05	1.14E-05	1.20E-05	1.51E-05	1.93E-05
NHWD	kg	6.42E-01	7.13E-01	7.49E-01	9.28E-01	1.33E+00
RWD	kg	1.86E-03	2.09E-03	2.20E-03	2.77E-03	3.57E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Townsville region

TABLE 11. ENVIRONMENTAL PROFILES (A1-A3), CONCRETE FOR SPECIAL APPLICATIONS, TOWNSVILLE (QLD), PER M³

Indicator	Unit	HIGH SLUMP 40 MPa	HIGH SLUMP 50 MPa	HIGH SLUMP 65 MPa	HIGH SLUMP 80 MPa
GWP	kg CO₂ eq	294	325	336	513
ODP	kg CFC11 eq	6.39E-06	6.77E-06	6.49E-06	6.91E-06
AP	kg SO ₂ eq	1.04	1.13	1.05	1.28
EP	kg PO ₄ ³⁻ eq	0.171	0.187	0.185	0.252
POCP	kg C ₂ H ₄ eq	0.0652	0.0692	0.0655	0.0741
ADPE	kg Sb eq	1.08E-05	5.25E-06	2.09E-05	3.73E-05
ADPF	MJ _{NCV}	2250	2440	2390	3270

TABLE 12. ENVIRONMENTAL PARAMETERS (A1-A3), CONCRETE FOR SPECIAL APPLICATIONS, TOWNSVILLE (QLD), PER M³

Parameter	Unit	HIGH SLUMP 40 MPa	HIGH SLUMP 50 MPa	HIGH SLUMP 65 MPa	HIGH SLUMP 80 MPa
PERE	MJ _{NCV}	3.35E+01	3.53E+01	3.61E+01	5.17E+01
PERM	MJ _{NCV}	0.00E+00	0.00E+00	2.48E-02	4.40E-02
PERT	MJ _{NCV}	3.35E+01	3.53E+01	3.61E+01	5.18E+01
PENRE	MJ _{NCV}	2.30E+03	2.50E+03	2.45E+03	3.33E+03
PENRM	MJ _{NCV}	1.31E+01	1.47E+01	1.84E+00	3.26E+00
PENRT	MJ _{NCV}	2.31E+03	2.51E+03	2.45E+03	3.34E+03
SM	kg	2.50E+02	2.70E+02	2.38E+02	1.27E+02
RSF	MJ _{NCV}	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
FW	m ³	3.15E+00	3.17E+00	3.16E+00	3.25E+00
HWD	kg	2.01E-05	1.86E-05	2.23E-05	4.05E-05
NHWD	kg	2.11E+00	3.51E-01	5.59E+00	1.01E+01
RWD	kg	3.86E-03	3.16E-03	4.50E-03	8.18E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

Townsville region

TABLE 13. ENVIRONMENTAL PROFILES (A1-A3), CONCRETE FOR SPECIAL APPLICATIONS, TOWNSVILLE (QLD), PER M³

Indicator	Unit	STABILISED SAND 12:1	KERB MACHINE 280kg	KERB MACHINE 320kg	TMR MTRS 70 / 40 MPa 20mm PUMP B2 EXPOSURE TREMIE B2 EXPOSURE	TMR MTRS 70 / 40 MPa 20mm PUMP B2 EXPOSURE	TMR MTRS 70 / 50 MPa 20mm TREMIE B2 EXPOSURE
GWP	kg CO ₂ eq	121	254	281	313	328	365
ODP	kg CFC11 eq	3.17E-06	4.75E-06	4.94E-06	5.48E-06	5.43E-06	5.98E-06
AP	kg SO ₂ eq	0.338	0.656	0.717	0.817	0.826	0.925
EP	kg PO ₄ ³⁻ eq	0.0694	0.135	0.147	0.164	0.170	0.188
POCP	kg C ₂ H ₄ eq	0.0283	0.0452	0.0475	0.0540	0.0530	0.0584
ADPE	kg Sb eq	5.05E-07	4.63E-06	4.48E-06	2.15E-05	6.70E-06	1.32E-05
ADPF	MJ _{NCV}	900	1710	1860	2120	2160	2380

TABLE 14. ENVIRONMENTAL PARAMETERS (A1-A3), CONCRETE FOR SPECIAL APPLICATIONS, TOWNSVILLE (QLD), PER M³

Parameter	Unit	STABILISED SAND 12:1	KERB MACHINE 280kg	KERB MACHINE 320kg	TMR MTRS 70 / 40 MPa 20mm PUMP B2 EXPOSURE TREMIE B2 EXPOSURE	TMR MTRS 70 / 40 MPa 20mm PUMP B2 EXPOSURE	TMR MTRS 70 / 50 MPa 20mm TREMIE B2 EXPOSURE
PERE	MJ _{NCV}	1.13E+01	2.30E+01	2.44E+01	3.49E+01	2.96E+01	3.47E+01
PERM	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00	1.15E-01	0.00E+00	8.66E-02
PERT	MJ _{NCV}	1.13E+01	2.30E+01	2.44E+01	3.50E+01	2.96E+01	3.48E+01
PENRE	MJ _{NCV}	9.25E+02	1.75E+03	1.90E+03	2.16E+03	2.20E+03	2.43E+03
PENRM	MJ _{NCV}	0.00E+00	6.31E+00	4.09E+00	8.56E+00	1.20E+01	6.42E+00
PENRT	MJ _{NCV}	9.25E+02	1.76E+03	1.91E+03	2.17E+03	2.21E+03	2.44E+03
SM	kg	4.16E+01	7.80E+01	8.84E+01	1.25E+02	1.04E+02	1.50E+02
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	2.79E+00	3.15E+00	3.00E+00	3.09E+00	3.11E+00	3.08E+00
HWD	kg	0.00E+00	9.35E-06	7.47E-06	3.74E-05	1.53E-05	2.48E-05
NHWD	kg	1.02E-01	7.59E-01	8.37E-01	5.08E+00	1.00E+00	2.91E+00
RWD	kg	0.00E+00	1.72E-03	1.40E-03	5.38E-03	2.81E-03	3.28E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
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

Townsville region

TABLE 15. ENVIRONMENTAL PROFILES (A1-A3), CONCRETE FOR SPECIAL APPLICATIONS, TOWNSVILLE (QLD), PER M³

Indicator	Unit	NO FINES 6:1	POST TENSIONED 40 MPa 22@3	POST TENSIONED 40 MPa 22@4	SHOTCRETE 32 MPa
GWP	kg CO ₂ eq	224	339	310	330
ODP	kg CFC11 eq	3.39E-06	5.43E-06	5.29E-06	5.56E-06
AP	kg SO ₂ eq	0.560	0.846	0.786	0.826
EP	kg PO ₄ ³⁻ eq	0.115	0.174	0.162	0.169
POCP	kg C ₂ H ₄ eq	0.0338	0.0538	0.0514	0.0544
ADPE	kg Sb eq	1.21E-06	6.60E-06	6.58E-06	6.54E-06
ADPF	MJ _{NCV}	1420	2210	2060	2180

TABLE 16. ENVIRONMENTAL PARAMETERS (A1-A3), CONCRETE FOR SPECIAL APPLICATIONS, TOWNSVILLE (QLD), PER M³

Parameter	Unit	NO FINES 6:1	POST TENSIONED 40 MPa 22@3	POST TENSIONED 40 MPa 22@4	SHOTCRETE 32 MPa
PERE	MJ _{NCV}	1.74E+01	3.05E+01	2.85E+01	3.02E+01
PERM	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ _{NCV}	1.74E+01	3.05E+01	2.85E+01	3.02E+01
PENRE	MJ _{NCV}	1.45E+03	2.26E+03	2.10E+03	2.22E+03
PENRM	MJ _{NCV}	0.00E+00	1.17E+01	1.24E+01	1.20E+01
PENRT	MJ _{NCV}	1.45E+03	2.27E+03	2.11E+03	2.24E+03
SM	kg	0.00E+00	1.14E+02	1.09E+02	9.88E+01
RSF	MJ _{NCV}	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
FW	m ³	2.43E+00	3.19E+00	3.13E+00	3.03E+00
HWD	kg	0.00E+00	1.49E-05	1.56E-05	1.53E-05
NHWD	kg	1.63E-01	9.91E-01	9.51E-01	1.00E+00
RWD	kg	0.00E+00	2.74E-03	2.84E-03	2.81E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

A nighttime photograph of a cityscape in the North Queensland region. The sky is a deep purple and blue, with some clouds. In the foreground, there is a parking lot with several cars. In the middle ground, there are several multi-story buildings, some of which are brightly lit from within. A prominent building on the left has a blue vertical stripe. In the background, more buildings and a large, curved structure are visible. The overall scene is a vibrant urban environment at dusk.

North Queensland region

Environmental profiles and parameters

Product table list

North Queensland

In each region, we start with presenting a summary of the carbon footprint (GWP summary) of our concrete mixes.

Lower carbon concrete products

Table No. 1 and 298

- ENVISIA® 20 MPa
- ENVISIA® 25 MPa
- ENVISIA® 32 MPa
- ENVISIA® 40 MPa
- ENVISIA® 50 MPa

Table No. 3 and 499

- ENVIROCRETE® PLUS 20 MPa
- ENVIROCRETE® PLUS 25 MPa
- ENVIROCRETE® PLUS 32 MPa
- ENVIROCRETE® PLUS 40 MPa
- ENVIROCRETE® PLUS 50 MPa

Table No. 5 and 6100

- ENVIROCRETE® 20 MPa
- ENVIROCRETE® 25 MPa
- ENVIROCRETE® 32 MPa
- ENVIROCRETE® 40 MPa
- ENVIROCRETE® 50 MPa

Normal class concrete products

Table No. 7 and 8101

- NORMAL CLASS GP BLEND 20 MPa
- NORMAL CLASS GP BLEND 25 MPa
- NORMAL CLASS GP BLEND 32 MPa
- NORMAL CLASS GP BLEND 40 MPa
- NORMAL CLASS GP BLEND 50 MPa

Table No. 9 and 10102

- NORMAL CLASS GP / FA BLEND 20 MPa
- NORMAL CLASS GP / FA BLEND 25 MPa
- NORMAL CLASS GP / FA BLEND 32 MPa
- NORMAL CLASS GP / FA BLEND 40 MPa
- NORMAL CLASS GP / FA BLEND 50 MPa

Concrete for special applications

Table No. 11 and 12103

- HIGH SLUMP 40 MPa
- HIGH SLUMP 50 MPa
- HIGH SLUMP 65 MPa
- HIGH SLUMP 80 MPa

Table No. 13 and 14104

- STABILISED SAND 14:1
- KERB MACHINE 280kg
- KERB MACHINE 320kg
- TMR MTRS 70 / 40 MPa 20mm PUMP B2 EXPOSURE
- TMR MTRS 70 / 40 MPa 20mm PUMP B2 EXPOSURE TREMIE B2 EXPOSURE
- TMR MTRS 70 / 50 MPa 20mm TREMIE B2 EXPOSURE

Table No. 15 and 16105

- NO FINES 6:1
- POST TENSIONED 40 MPa 22@4
- SHOTCRETE 32 MPa

Cradle-to-gate GWP summary (kg CO₂ eq / m³)

North Queensland

ENVISIA® 20 MPa	ENVISIA® 25 MPa	ENVISIA® 32 MPa	ENVISIA® 40 MPa	ENVISIA® 50 MPa	
159	172	192	227	292	
ENVIROCRETE® PLUS 20 MPa	ENVIROCRETE® PLUS 25 MPa	ENVIROCRETE® PLUS 32 MPa	ENVIROCRETE® PLUS 40 MPa	ENVIROCRETE® PLUS 50 MPa	
165	179	199	236	304	
ENVIROCRETE® 20 MPa	ENVIROCRETE® 25 MPa	ENVIROCRETE® 32 MPa	ENVIROCRETE® 40 MPa	ENVIROCRETE® 50 MPa	
169	184	205	243	313	
NORMAL GP BLEND 20 MPa	NORMAL GP BLEND 25 MPa	NORMAL GP BLEND 32 MPa	NORMAL GP BLEND 40 MPa	NORMAL GP BLEND 50 MPa	
257	287	312	398	500	
NORMAL GP / FA BLEND 20 MPa	NORMAL GP / FA BLEND 25 MPa	NORMAL GP / FA BLEND 32 MPa	NORMAL GP / FA BLEND 40 MPa	NORMAL GP / FA BLEND 50 MPa	
211	230	258	308	399	
HIGH SLUMP 40 MPa	HIGH SLUMP 50 MPa	HIGH SLUMP 65 MPa	HIGH SLUMP 80 MPa		
315	348	362	547		
STABILISED SAND 14:1	KERB MACHINE 280kg	KERB MACHINE 320kg	TMR MTRS 70 / 40 MPa 20mm PUMP B2 EXPOSURE TREMIE B2 EXPOSURE	TMR MTRS 70 / 40 MPa 20mm PUMP B2 EXPOSURE	TMR MTRS 70 / 50 MPa 20mm TREMIE B2 EXPOSURE
71	243	360	332	358	421
NO FINES 6:1	POST TENSIONED 40 MPa 22@4	SHOTCRETE 32 MPa			
233	316	343			

North Queensland region

TABLE 1. ENVIRONMENTAL PROFILES (A1-A3), LOWER CARBON CONCRETE, NORTH QUEENSLAND, PER M³

Indicator	Unit	ENVISIA® 20 MPa	ENVISIA® 25 MPa	ENVISIA® 32 MPa	ENVISIA® 40 MPa	ENVISIA® 50 MPa
GWP	kg CO₂ eq	159	172	192	227	292
ODP	kg CFC11 eq	6.27E-06	6.58E-06	7.03E-06	7.88E-06	9.35E-06
AP	kg SO ₂ eq	0.707	0.766	0.849	1.00	1.28
EP	kg PO ₄ ³⁻ eq	0.108	0.116	0.127	0.148	0.186
POCP	kg C ₂ H ₄ eq	0.0582	0.0616	0.0663	0.0752	0.0911
ADPE	kg Sb eq	3.23E-06	3.55E-06	3.95E-06	4.77E-06	7.37E-06
ADPF	MJ _{NCV}	1460	1570	1730	2020	2550

TABLE 2. ENVIRONMENTAL PARAMETERS (A1-A3), LOWER CARBON CONCRETE, NORTH QUEENSLAND, PER M³

Parameter	Unit	ENVISIA® 20 MPa	ENVISIA® 25 MPa	ENVISIA® 32 MPa	ENVISIA® 40 MPa	ENVISIA® 50 MPa
PERE	MJ _{NCV}	1.87E+01	2.04E+01	2.26E+01	2.70E+01	3.55E+01
PERM	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ _{NCV}	1.87E+01	2.04E+01	2.26E+01	2.70E+01	3.55E+01
PENRE	MJ _{NCV}	1.52E+03	1.63E+03	1.79E+03	2.09E+03	2.63E+03
PENRM	MJ _{NCV}	4.31E+00	4.78E+00	5.45E+00	6.69E+00	1.07E+01
PENRT	MJ _{NCV}	1.52E+03	1.64E+03	1.80E+03	2.10E+03	2.64E+03
SM	kg	1.40E+02	1.56E+02	1.78E+02	2.18E+02	2.90E+02
RSF	MJ _{NCV}	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
FW	m ³	3.22E+00	3.22E+00	3.23E+00	3.24E+00	3.24E+00
HWD	kg	6.23E-06	6.89E-06	7.56E-06	9.29E-06	1.49E-05
NHWD	kg	5.78E-01	6.38E-01	7.19E-01	8.72E-01	1.36E+00
RWD	kg	1.16E-03	1.28E-03	1.42E-03	1.74E-03	2.81E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

North Queensland region

TABLE 3. ENVIRONMENTAL PROFILES (A1-A3), LOWER CARBON CONCRETE, NORTH QUEENSLAND, PER M³

Indicator	Unit	ENVIROCRETE® PLUS 20 MPa	ENVIROCRETE® PLUS 25 MPa	ENVIROCRETE® PLUS 32 MPa	ENVIROCRETE® PLUS 40 MPa	ENVIROCRETE® PLUS 50 MPa
GWP	kg CO₂ eq	165	179	199	236	304
ODP	kg CFC11 eq	6.20E-06	6.50E-06	6.94E-06	7.76E-06	9.20E-06
AP	kg SO ₂ eq	0.666	0.719	0.796	0.937	1.19
EP	kg PO ₄ ³⁻ eq	0.109	0.117	0.128	0.149	0.187
POCP	kg C ₂ H ₄ eq	0.0570	0.0602	0.0648	0.0734	0.0889
ADPE	kg Sb eq	6.24E-06	6.89E-06	7.81E-06	9.51E-06	1.52E-05
ADPF	MJ _{NCV}	1460	1560	1720	2010	2540

TABLE 4. ENVIRONMENTAL PARAMETERS (A1-A3), LOWER CARBON CONCRETE, NORTH QUEENSLAND, PER M³

Parameter	Unit	ENVIROCRETE® PLUS 20 MPa	ENVIROCRETE® PLUS 25 MPa	ENVIROCRETE® PLUS 32 MPa	ENVIROCRETE® PLUS 40 MPa	ENVIROCRETE® PLUS 50 MPa
PERE	MJ _{NCV}	1.85E+01	2.01E+01	2.25E+01	2.67E+01	3.57E+01
PERM	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ _{NCV}	1.85E+01	2.01E+01	2.25E+01	2.67E+01	3.57E+01
PENRE	MJ _{NCV}	1.51E+03	1.62E+03	1.78E+03	2.07E+03	2.62E+03
PENRM	MJ _{NCV}	5.17E+00	5.74E+00	6.56E+00	8.03E+00	1.28E+01
PENRT	MJ _{NCV}	1.52E+03	1.63E+03	1.79E+03	2.08E+03	2.63E+03
SM	kg	1.29E+02	1.44E+02	1.63E+02	2.01E+02	2.66E+02
RSF	MJ _{NCV}	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
FW	m ³	3.20E+00	3.20E+00	3.20E+00	3.21E+00	3.20E+00
HWD	kg	9.61E-06	1.07E-05	1.22E-05	1.49E-05	2.42E-05
NHWD	kg	1.39E+00	1.54E+00	1.74E+00	2.13E+00	3.46E+00
RWD	kg	1.92E-03	2.13E-03	2.43E-03	2.98E-03	4.84E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

North Queensland region

TABLE 5. ENVIRONMENTAL PROFILES (A1-A3), LOWER CARBON CONCRETE, NORTH QUEENSLAND, PER M³

Indicator	Unit	ENVIROCRETE® 20 MPa	ENVIROCRETE® 25 MPa	ENVIROCRETE® 32 MPa	ENVIROCRETE® 40 MPa	ENVIROCRETE® 50 MPa
GWP	kg CO₂ eq	169	184	205	243	313
ODP	kg CFC11 eq	6.09E-06	6.39E-06	6.80E-06	7.60E-06	8.98E-06
AP	kg SO ₂ eq	0.631	0.681	0.752	0.884	1.12
EP	kg PO ₄ ³⁻ eq	0.109	0.117	0.128	0.149	0.187
POCP	kg C ₂ H ₄ eq	0.0554	0.0584	0.0626	0.0707	0.0852
ADPE	kg Sb eq	3.18E-06	3.49E-06	3.89E-06	4.69E-06	7.26E-06
ADPF	MJ _{NCV}	1430	1540	1690	1970	2480

TABLE 6. ENVIRONMENTAL PARAMETERS (A1-A3), LOWER CARBON CONCRETE, NORTH QUEENSLAND, PER M³

Parameter	Unit	ENVIROCRETE® 20 MPa	ENVIROCRETE® 25 MPa	ENVIROCRETE® 32 MPa	ENVIROCRETE® 40 MPa	ENVIROCRETE® 50 MPa
PERE	MJ _{NCV}	1.67E+01	1.81E+01	2.00E+01	2.37E+01	3.12E+01
PERM	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ _{NCV}	1.67E+01	1.81E+01	2.00E+01	2.37E+01	3.12E+01
PENRE	MJ _{NCV}	1.49E+03	1.59E+03	1.75E+03	2.03E+03	2.56E+03
PENRM	MJ _{NCV}	4.31E+00	4.78E+00	5.45E+00	6.69E+00	1.07E+01
PENRT	MJ _{NCV}	1.49E+03	1.60E+03	1.75E+03	2.04E+03	2.57E+03
SM	kg	1.16E+02	1.30E+02	1.48E+02	1.82E+02	2.41E+02
RSF	MJ _{NCV}	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
FW	m ³	3.19E+00	3.18E+00	3.19E+00	3.19E+00	3.17E+00
HWD	kg	6.23E-06	6.89E-06	7.56E-06	9.29E-06	1.49E-05
NHWD	kg	5.63E-01	6.20E-01	6.99E-01	8.48E-01	1.33E+00
RWD	kg	1.16E-03	1.28E-03	1.42E-03	1.74E-03	2.81E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

North Queensland region

TABLE 7. ENVIRONMENTAL PROFILES (A1-A3), NORMAL CLASS CONCRETE, NORTH QUEENSLAND, PER M³

Indicator	Unit	NORMAL CLASS GP BLEND 20 MPa	NORMAL CLASS GP BLEND 25 MPa	NORMAL CLASS GP BLEND 32 MPa	NORMAL CLASS GP BLEND 40 MPa	NORMAL CLASS GP BLEND 50 MPa
GWP	kg CO₂ eq	257	287	312	398	500
ODP	kg CFC11 eq	6.14E-06	6.51E-06	6.80E-06	7.92E-06	9.14E-06
AP	kg SO ₂ eq	0.687	0.756	0.814	1.01	1.25
EP	kg PO ₄ ³⁻ eq	0.139	0.153	0.165	0.205	0.253
POCP	kg C ₂ H ₄ eq	0.0581	0.0622	0.0655	0.0777	0.0916
ADPE	kg Sb eq	3.34E-06	3.68E-06	4.08E-06	4.98E-06	7.60E-06
ADPF	MJ _{NCV}	1800	1980	2130	2650	3270

TABLE 8. ENVIRONMENTAL PARAMETERS (A1-A3), NORMAL CLASS CONCRETE, NORTH QUEENSLAND, PER M³

Parameter	Unit	NORMAL CLASS GP BLEND 20 MPa	NORMAL CLASS GP BLEND 25 MPa	NORMAL CLASS GP BLEND 32 MPa	NORMAL CLASS GP BLEND 40 MPa	NORMAL CLASS GP BLEND 50 MPa
PERE	MJ _{NCV}	2.08E+01	2.31E+01	2.50E+01	3.14E+01	4.01E+01
PERM	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ _{NCV}	2.08E+01	2.31E+01	2.50E+01	3.14E+01	4.01E+01
PENRE	MJ _{NCV}	1.85E+03	2.04E+03	2.19E+03	2.72E+03	3.35E+03
PENRM	MJ _{NCV}	4.31E+00	4.78E+00	5.45E+00	6.69E+00	1.07E+01
PENRT	MJ _{NCV}	1.86E+03	2.04E+03	2.20E+03	2.73E+03	3.36E+03
SM	kg	1.96E-03	2.22E-03	2.45E-03	3.20E-03	4.09E-03
RSF	MJ _{NCV}	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
FW	m ³	3.27E+00	3.28E+00	3.28E+00	3.33E+00	3.34E+00
HWD	kg	6.23E-06	6.89E-06	7.56E-06	9.29E-06	1.49E-05
NHWD	kg	5.94E-01	6.58E-01	7.36E-01	9.05E-01	1.40E+00
RWD	kg	1.16E-03	1.28E-03	1.42E-03	1.74E-03	2.81E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

North Queensland region

TABLE 9. ENVIRONMENTAL PROFILES (A1-A3), NORMAL CLASS CONCRETE, NORTH QUEENSLAND, PER M³

Indicator	Unit	NORMAL CLASS GP / FA BLEND 20 MPa	NORMAL CLASS GP / FA BLEND 25 MPa	NORMAL CLASS GP / FA BLEND 32 MPa	NORMAL CLASS GP / FA BLEND 40 MPa	NORMAL CLASS GP / FA BLEND 50 MPa
GWP	kg CO ₂ eq	211	230	258	308	399
ODP	kg CFC11 eq	6.14E-06	6.43E-06	6.86E-06	7.67E-06	9.07E-06
AP	kg SO ₂ eq	0.600	0.646	0.713	0.835	1.06
EP	kg PO ₄ ³⁻ eq	0.122	0.131	0.145	0.169	0.214
POCP	kg C ₂ H ₄ eq	0.0554	0.0584	0.0627	0.0708	0.0853
ADPE	kg Sb eq	3.23E-06	3.54E-06	3.95E-06	4.77E-06	7.36E-06
ADPF	MJ _{NCV}	1560	1680	1850	2170	2750

TABLE 10. ENVIRONMENTAL PARAMETERS (A1-A3), NORMAL CLASS CONCRETE, NORTH QUEENSLAND, PER M³

Parameter	Unit	NORMAL CLASS GP / FA BLEND 20 MPa	NORMAL CLASS GP / FA BLEND 25 MPa	NORMAL CLASS GP / FA BLEND 32 MPa	NORMAL CLASS GP / FA BLEND 40 MPa	NORMAL CLASS GP / FA BLEND 50 MPa
PERE	MJ _{NCV}	1.73E+01	1.87E+01	2.08E+01	2.47E+01	3.24E+01
PERM	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ _{NCV}	1.73E+01	1.87E+01	2.08E+01	2.47E+01	3.24E+01
PENRE	MJ _{NCV}	1.62E+03	1.74E+03	1.91E+03	2.24E+03	2.83E+03
PENRM	MJ _{NCV}	4.31E+00	4.78E+00	5.45E+00	6.69E+00	1.07E+01
PENRT	MJ _{NCV}	1.62E+03	1.74E+03	1.92E+03	2.25E+03	2.84E+03
SM	kg	5.82E+01	6.55E+01	7.38E+01	9.15E+01	1.21E+02
RSF	MJ _{NCV}	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
FW	m ³	3.22E+00	3.21E+00	3.22E+00	3.23E+00	3.23E+00
HWD	kg	6.23E-06	6.89E-06	7.56E-06	9.29E-06	1.49E-05
NHWD	kg	5.67E-01	6.25E-01	7.05E-01	8.55E-01	1.34E+00
RWD	kg	1.16E-03	1.28E-03	1.42E-03	1.74E-03	2.81E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

North Queensland region

TABLE 11. ENVIRONMENTAL PROFILES (A1-A3), CONCRETE FOR SPECIAL APPLICATIONS, NORTH QUEENSLAND, PER M³

Indicator	Unit	HIGH SLUMP 40 MPa	HIGH SLUMP 50 MPa	HIGH SLUMP 65 MPa	HIGH SLUMP 80 MPa
GWP	kg CO ₂ eq	315	348	362	547
ODP	kg CFC11 eq	9.25E-06	9.89E-06	1.00E-05	1.14E-05
AP	kg SO ₂ eq	1.14	1.23	1.18	1.45
EP	kg PO ₄ ³⁻ eq	0.189	0.207	0.208	0.284
POCP	kg C ₂ H ₄ eq	0.0880	0.0942	0.0947	0.113
ADPE	kg Sb eq	1.05E-05	4.93E-06	2.06E-05	3.71E-05
ADPF	MJ _{NCV}	2530	2760	2750	3740

TABLE 12. ENVIRONMENTAL PARAMETERS (A1-A3), CONCRETE FOR SPECIAL APPLICATIONS, NORTH QUEENSLAND, PER M³

Parameter	Unit	HIGH SLUMP 40 MPa	HIGH SLUMP 50 MPa	HIGH SLUMP 65 MPa	HIGH SLUMP 80 MPa
PERE	MJ _{NCV}	3.30E+01	3.49E+01	3.56E+01	5.14E+01
PERM	MJ _{NCV}	0.00E+00	0.00E+00	2.48E-02	4.40E-02
PERT	MJ _{NCV}	3.30E+01	3.49E+01	3.56E+01	5.14E+01
PENRE	MJ _{NCV}	2.61E+03	2.84E+03	2.84E+03	3.84E+03
PENRM	MJ _{NCV}	1.31E+01	1.47E+01	1.84E+00	3.26E+00
PENRT	MJ _{NCV}	2.62E+03	2.86E+03	2.84E+03	3.84E+03
SM	kg	2.50E+02	2.70E+02	2.38E+02	1.27E+02
RSF	MJ _{NCV}	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
FW	m ³	3.18E+00	3.22E+00	3.20E+00	3.32E+00
HWD	kg	2.01E-05	1.86E-05	2.23E-05	4.05E-05
NHWD	kg	2.10E+00	3.41E-01	5.58E+00	1.01E+01
RWD	kg	3.86E-03	3.16E-03	4.50E-03	8.18E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01
MER	kg	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

North Queensland Region

TABLE 13. ENVIRONMENTAL PROFILES (A1-A3), CONCRETE FOR SPECIAL APPLICATIONS, NORTH QUEENSLAND, PER M³

Indicator	Unit	STABILISED SAND 14:1	KERB MACHINE 280kg	KERB MACHINE 320kg	TMR MTRS 70 / 40 MPa 20mm PUMP B2 EXPOSURE TREMIE B2 EXPOSURE	TMR MTRS 70 / 40 MPa 20mm PUMP B2 EXPOSURE	TMR MTRS 70 / 50 MPa 20mm TREMIE B2 EXPOSURE
GWP	kg CO₂ eq	71	243	360	332	358	421
ODP	kg CFC11 eq	3.55E-06	7.04E-06	7.68E-06	8.49E-06	8.29E-06	9.29E-06
AP	kg SO ₂ eq	0.541	0.687	0.929	0.919	0.953	1.10
EP	kg PO ₄ ³⁻ eq	0.051	0.139	0.188	0.183	0.193	0.225
POCP	kg C ₂ H ₄ eq	0.0282	0.0637	0.0747	0.0790	0.0774	0.0891
ADPE	kg Sb eq	5.03E-07	4.50E-06	5.57E-06	1.59E-05	5.62E-06	1.52E-05
ADPF	MJ _{NCV}	640	1790	2440	2380	2470	2980

TABLE 14. ENVIRONMENTAL PARAMETERS (A1-A3), CONCRETE FOR SPECIAL APPLICATIONS, NORTH QUEENSLAND, PER M³

Parameter	Unit	STABILISED SAND 14:1	KERB MACHINE 280kg	KERB MACHINE 320kg	TMR MTRS 70 / 40 MPa 20mm PUMP B2 EXPOSURE TREMIE B2 EXPOSURE	TMR MTRS 70 / 40 MPa 20mm PUMP B2 EXPOSURE	TMR MTRS 70 / 50 MPa 20mm TREMIE B2 EXPOSURE
PERE	MJ _{NCV}	5.24E+00	1.97E+01	2.90E+01	3.09E+01	2.85E+01	4.13E+01
PERM	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00	7.21E-02	0.00E+00	0.00E+00
PERT	MJ _{NCV}	5.24E+00	1.97E+01	2.90E+01	3.10E+01	2.85E+01	4.13E+01
PENRE	MJ _{NCV}	6.68E+02	1.85E+03	2.51E+03	2.46E+03	2.54E+03	3.05E+03
PENRM	MJ _{NCV}	0.00E+00	4.02E+00	6.12E+00	5.35E+00	7.94E+00	3.41E+01
PENRT	MJ _{NCV}	6.68E+02	1.86E+03	2.52E+03	2.46E+03	2.55E+03	3.08E+03
SM	kg	1.04E+02	8.74E+01	2.85E-03	1.25E+02	1.08E+02	1.25E+02
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	2.22E+00	3.13E+00	3.25E+00	3.22E+00	3.22E+00	3.23E+00
HWD	kg	0.00E+00	7.61E-06	9.71E-06	2.55E-05	1.10E-05	4.23E-05
NHWD	kg	6.73E-02	9.34E-01	1.11E+00	3.88E+00	1.01E+00	2.16E+00
RWD	kg	0.00E+00	1.46E-03	1.86E-03	3.86E-03	2.07E-03	7.72E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01	9.60E+01
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

North Queensland Region

TABLE 15. ENVIRONMENTAL PROFILES (A1-A3), CONCRETE FOR SPECIAL APPLICATIONS, NORTH QUEENSLAND, PER M³

Indicator	Unit	NO FINES 6:1	POST TENSIONED 40 MPa 22@4	SHOTCRETE 32 MPa
GWP	kg CO ₂ eq	233	316	343
ODP	kg CFC11 eq	4.71E-06	7.65E-06	8.68E-06
AP	kg SO ₂ eq	0.606	0.853	0.930
EP	kg PO ₄ ³⁻ eq	0.124	0.174	0.188
POCP	kg C ₂ H ₄ eq	0.0452	0.0711	0.0803
ADPE	kg Sb eq	8.91E-07	5.69E-06	7.29E-06
ADPF	MJ _{NCV}	1550	2230	2440

TABLE 16. ENVIRONMENTAL PARAMETERS (A1-A3), CONCRETE FOR SPECIAL APPLICATIONS, NORTH QUEENSLAND, PER M³

Parameter	Unit	NO FINES 6:1	POST TENSIONED 40 MPa 22@4	SHOTCRETE 32 MPa
PERE	MJ _{NCV}	1.72E+01	2.62E+01	2.85E+01
PERM	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00
PERT	MJ _{NCV}	1.72E+01	2.62E+01	2.85E+01
PENRE	MJ _{NCV}	1.59E+03	2.29E+03	2.51E+03
PENRM	MJ _{NCV}	0.00E+00	1.02E+01	1.02E+01
PENRT	MJ _{NCV}	1.59E+03	2.30E+03	2.52E+03
SM	kg	1.87E-03	9.36E+01	1.29E+02
RSF	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ _{NCV}	0.00E+00	0.00E+00	0.00E+00
FW	m ³	2.49E+00	3.25E+00	3.07E+00
HWD	kg	0.00E+00	1.31E-05	1.47E-05
NHWD	kg	1.57E-01	8.98E-01	1.38E+00
RWD	kg	0.00E+00	2.41E-03	2.78E-03
CRU	kg	0.00E+00	0.00E+00	0.00E+00
MFR	kg	9.60E+01	9.60E+01	9.60E+01
MER	kg	0.00E+00	0.00E+00	0.00E+00
EE	MJ	0.00E+00	0.00E+00	0.00E+00

Other environmental information

Water management

Water is a valuable resource and good quality fresh water is essential to our concrete, construction material and plasterboard operations. We use water in manufacturing, and for dust suppression, cleaning and sanitation. Our quarry and asphalt operations are able to use recycled, brackish and / or process water.

At our larger sites, including quarries, we also capture rainfall or stream flow that is largely used for dust control purposes. We are developing systems that will enable us to collect data on captured rainfall and are developing plans that will underpin an overall improvement in water efficiency.

When developing or purchasing new facilities, our due diligence assessment includes scenario analysis of the quantity and quality of water, assessment of the risks of potential water discharges, and, where relevant, river catchment assessments to ensure sufficient water availability and supply.

Waste and recycling

Throughout Boral's operations, some materials are commonly re-used back into our production processes. Returned concrete is used to make concrete blocks at some plants. This beneficially uses materials that would otherwise require disposal. A large proportion of Boral's recycled and lower carbon products revenue, totalling nine percent of Boral Limited revenue, is derived from external waste products.

This includes our fly ash and recycling businesses. Opportunities for the re-use of production by-products or waste material continues to grow and are actively being pursued.

Biodiversity management

Protecting the diversity of plant and animal species at and around our operational sites is a core component of our land management efforts. Some examples of the many initiatives to protect biodiversity at our own sites include:

- Maintaining **koala fodder plantations** at Narangba and Petrie quarries in Queensland.
- Collaborating with the **Royal Botanic Garden, Sydney, NSW** in research on the endangered Illawarra Socketwood population at our Dunmore Quarry in New South Wales.
- Partnering with **Sleepy Burrows Wombat Sanctuary** to capture and relocate wombats found at our Peppertree Quarry in New South Wales.
- Boral in WA has completed a number of community projects at **Orange Grove Primary School** including a Heritage Garden space, installation of garden pathways and cockatoo nesting boxes.
- Conservation work to provide habitat for the threatened **legless lizard** and **spiny rice-flower** at Deer Park Quarry in Victoria.
- Construction of a **bird island habitat** as part of our rehabilitation of wetlands at our Dunmore Quarry in New South Wales.
- Through our community partnership with **Conservation Volunteers Australia**, we support conservation and education initiatives in our local communities, including native vegetation initiatives in local reserves and schools.

Our approach to climate related risks

Our approach

Boral recognises that climate related physical risks and a global transition to a lower-carbon future are expected to impact our operations, customers and suppliers. We support the Paris Agreement and mechanisms to achieve its objective of limiting future average global temperature rises to well below 2°C, as well as Australia’s 2030 target of a 26–28% reduction in carbon emissions below 2005 levels.

Looking at how Boral’s carbon emissions are tracking relative to 2005 levels, in Australia we have reduced emissions by around 40% since FY2005. We achieved about half of this decrease largely by realigning our portfolio away from emissions-intensive businesses. The remainder of the decrease is due to reducing clinker manufacturing in Australia in favour of importing it from more efficient and larger scale operations in Asia. Including Boral North America, our Scope 1 and 2 emissions decreased by 43% since FY2005. We continue to progressively adopt the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD). In FY2019, we enhanced our climate-related governance and risk management, completed scenario analysis of Boral Cement’s business and continued to strengthen our resilience to a 2°C scenario. We also broadened our reporting of physical climate-related risks and Scope 3 emissions.

We completed a Group-wide review of our climate-related risks and opportunities using the TCFD framework. This review informed a two-year roadmap to undertake further scenario analysis of key climate related business risks. We transparently and constructively engaged with Climate Action 100+ investor representatives and other stakeholders during the year, sharing our progress in aligning our efforts with the TCFD recommendations and building greater resilience to climate-related impacts.



Our approach to climate related risks

Energy and climate policy

Boral has not identified any major positions on energy and climate policy held by our industry associations that are materially inconsistent with Boral's position.

We support:

- **A national approach to climate and energy policy** to ensure that least-cost carbon emissions abatement is targeted while ensuring reliable and competitive energy can be delivered.
- **Climate and energy policies** that do not unduly erode the competitiveness of domestic based businesses.

Through our community partnership with Conservation Volunteers Australia, we support conservation and education initiatives in our local communities, including native vegetation initiatives in local reserves and schools.

In Australia, we are a member of the Cement Industry Federation (CIF). The CIF policy is to support the Federal Government's national target to reduce emissions by 26–28 percent by 2030, and the CIF has been working with the World Business Council for Sustainable Development and its current roadmap to reduce emissions.

Boral acknowledges the Paris Agreement and supports mechanisms to achieve its objectives, including a national approach to climate and energy policy. Boral's major industry associations are:

- Green Building Council of Australia (GBCA)
- Infrastructure Sustainability Council (ISC)
- Concrete Institute of Australia (CIA)
- Australian Pozzolan Association (APozA)
- Business Council of Australia
- Cement Industry Federation
- Cement, Concrete & Aggregates Australia
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