



CONCRETE TECHNOLOGY

CO₂



The Hard Truth

Concrete is the bedrock of modern construction and infrastructure but architectural aspirations should never come at the cost of the environment.

Concrete plays a significant role in the planet's carbon footprint, with a startling 4-8% of global CO₂ emissions tied to its lifecycle. The plot thickens with cement, concrete's critical ingredient, which is a major player in the environmental narrative due to its hefty emissions.

Embracing a vision for a more sustainable future, Concor has been navigating a greener course over the past decade, aiming to significantly lessen the carbon impact of its concrete products. The following slides unveil our innovative strategies and bold steps towards a more sustainable concrete future, showcasing our commitment to reducing CO₂ emissions and paving the way for a cleaner, healthier planet.

Our Progress

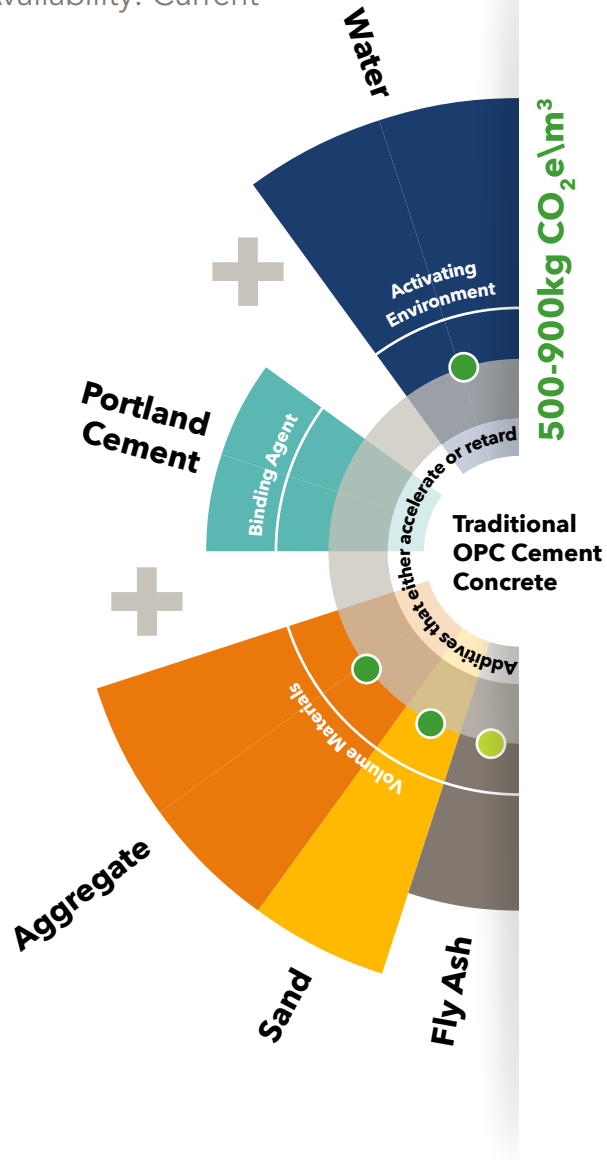
Concor has been developing its concrete design formulations over the last two decades to reduce the amounts of raw materials and water with no reduction in quality and a reduction in CO₂ emissions. The following graphs give an indication of our different concrete offerings.

Tech 1a:

Traditional OPC

Cement Concrete

Availability: Current

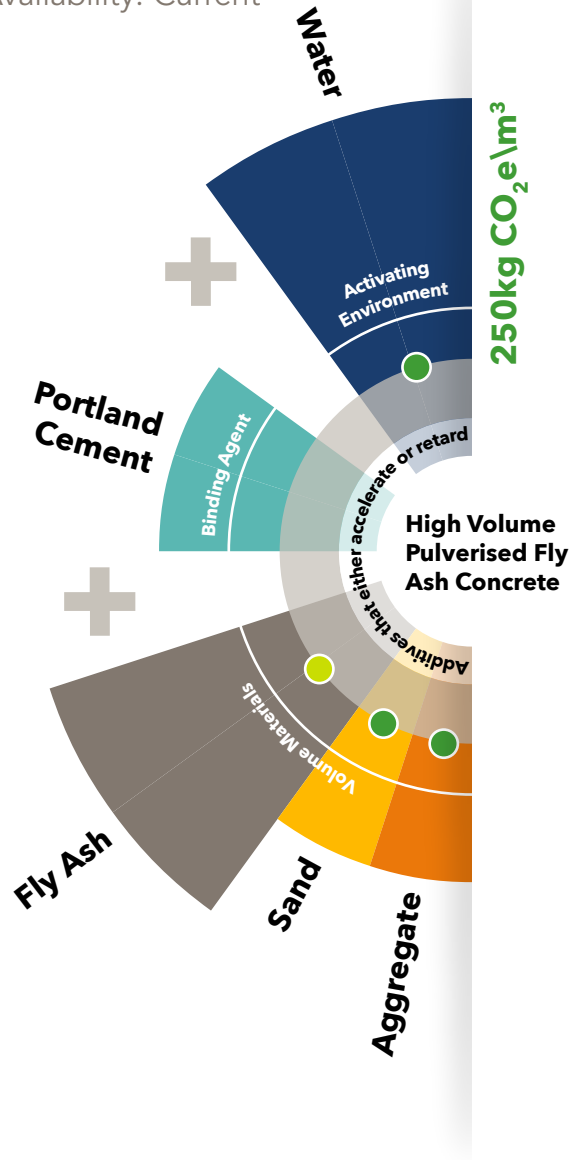


Tech 1b:

Low-Carbon OPC

Cement Concrete

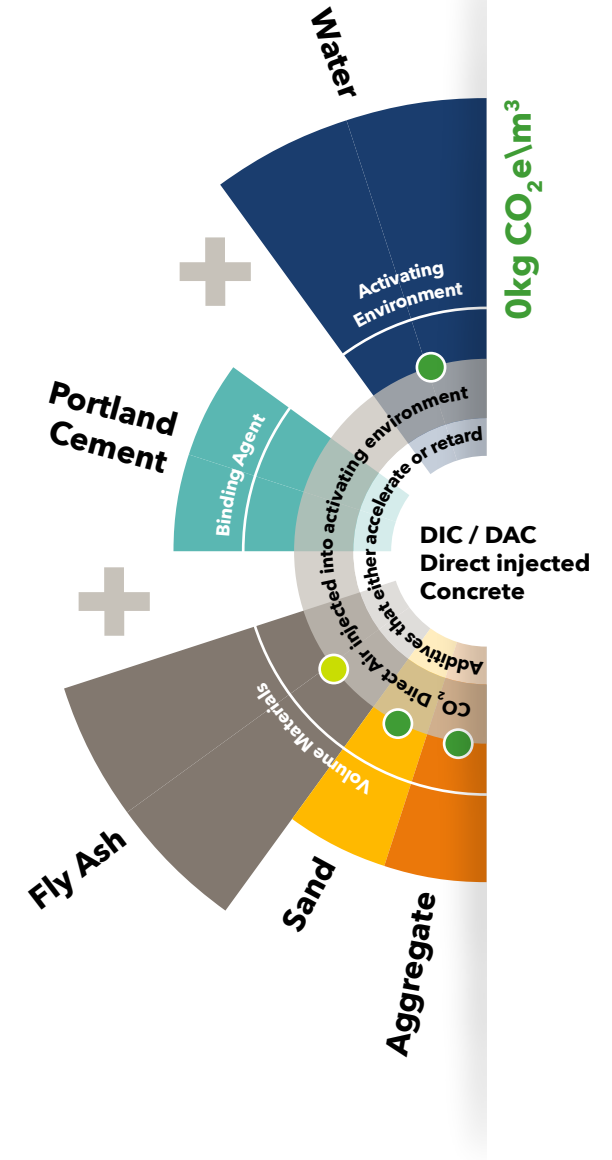
Availability: Current



Tech 1c:

CO₂ Direct injected Concrete

Availability: 2028

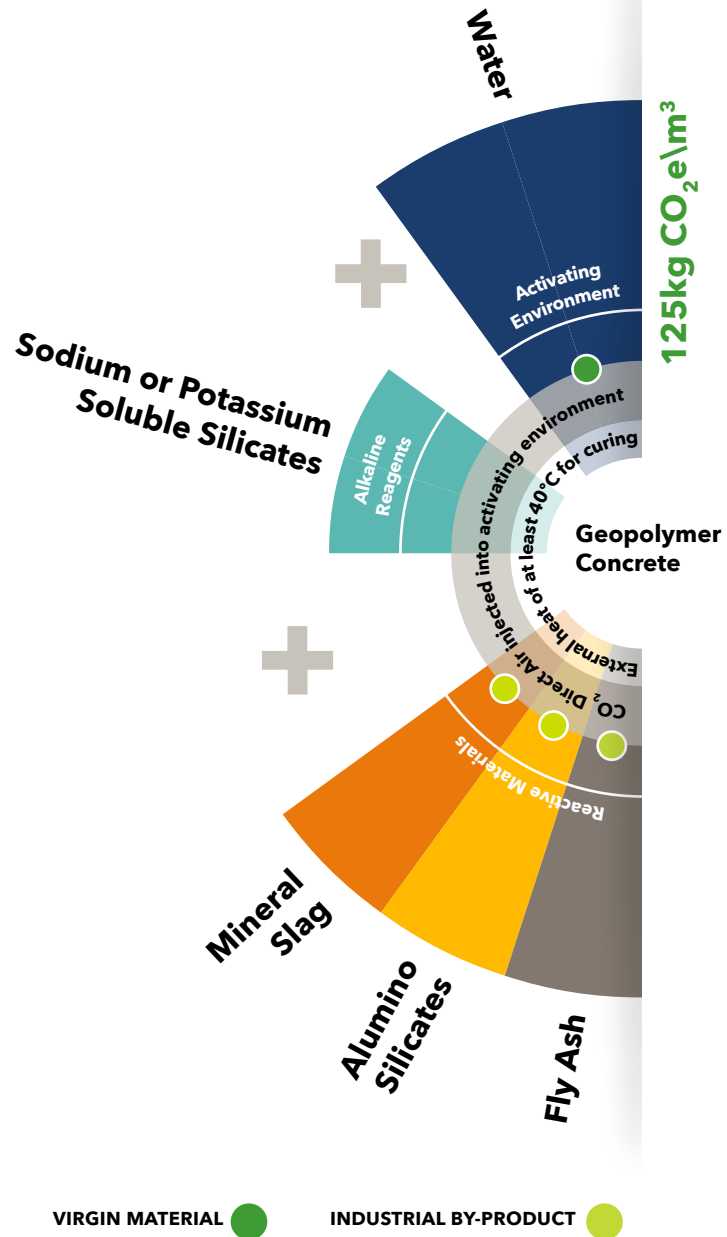


VIRGIN MATERIAL

INDUSTRIAL BY-PRODUCT

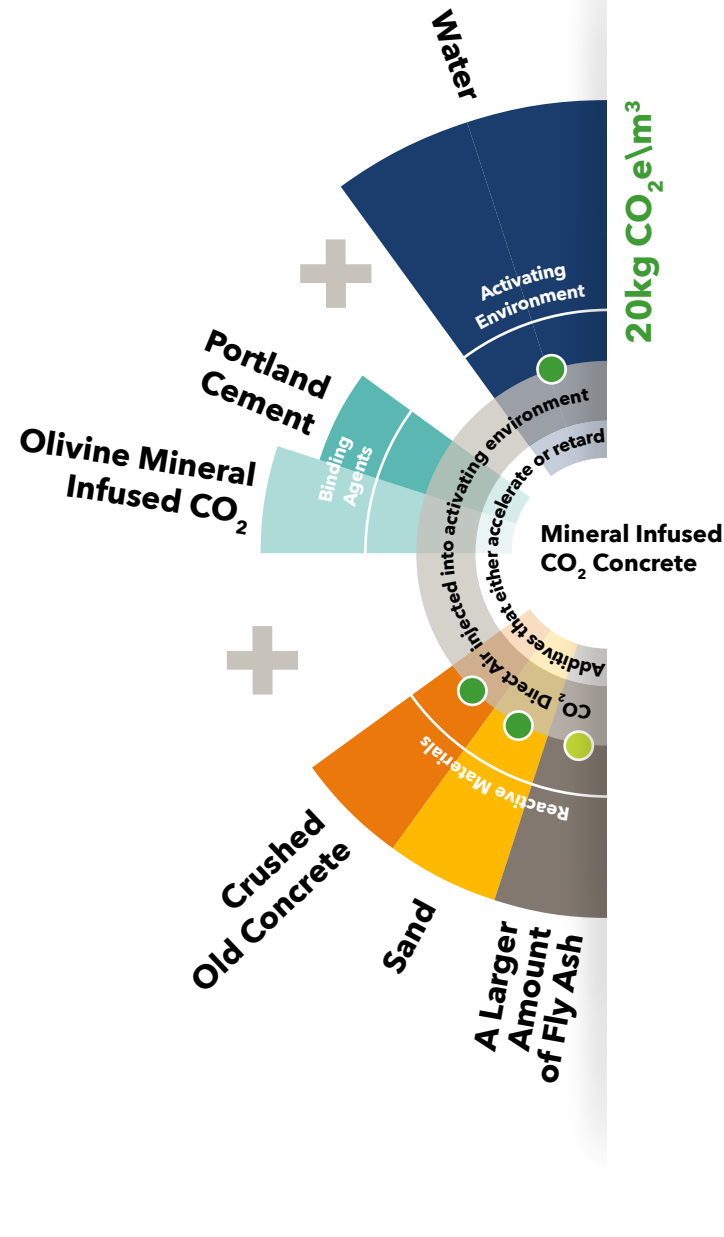
Tech 2a:

Geopolymer Concrete
Availability: Current



Tech 2b:

Mineralised Concrete
Availability: 2035



Certification

Concor proudly bears a four-star Eco-Product Label for our innovative low cement concrete. This groundbreaking material was crucial in constructing the robust foundations for wind turbines at Khobab Wind Farm in the Northern Cape, showcasing our commitment to renewable energy infrastructure.



Concor's core purpose is to lay the foundations for community development through our expertise in world-class construction and mining projects. We're not just building infrastructure; we're crafting the very backbone of societies, empowering growth, and fostering connections that bring us closer. Our commitment goes beyond projects and profits; it's about creating legacies that uplift, inspire, and endure, transforming landscapes in our quest for a better, more connected world.



Perdekraal Wind Farm

The turbine foundations are designed using a 70% replacement of cement, which equates to a 32,5% reduction in CO₂ from this client's previously constructed projects.



City Deep Container Terminal

Amalgam, Johannesburg, South Africa
(Recovery of old concrete for reuse)

PROJECT TYPE:

Demolition construction platform and rebuild

CLIENT: Transnet

PROJECT DURATION: 24 months

PROJECT DESCRIPTION:

- Rebuild Johannesburg City Deep Container Terminal, placing new concrete paving, civil services, electrical and lighting upgrade.
- Meet or beat clients target of 144 000m² to be resurfaced with a key stipulation to recycle more than 10 000m² of the original concrete in the new build.

CONTROLS:

- Concor exceeded this requirement by processing 35 000m² of layer works.
- The innovation was however use of a new geopolymers High Volume Pulverised Flue Ash concrete to surface the terminal.
- This geopolymer concrete relied on using industrial by-products to form a solid binder that has similar characteristics to Portland cement.
- Using this technique, embedded product CO₂ emissions were reduced by up to 90% while the concrete also has an improved resistance to fire and aggressive chemicals.
- This project was submitted to Nedbank's Capital Sustainable Business Awards: Infrastructure and Renewable Energy Category ending second nationally after Thokomodiso House, a green star building also built by Concor.

Khobab Wind Farm

Northern Cape, South Africa

(Site Ecological sensitivity management
and use of low-carbon concretes)

PROJECT TYPE:

Bulk earthworks,
access roads, concrete
bases and plinths

CLIENT: Mainstream
Renewable Energy

PROJECT DURATION: 34 months

PROJECT DESCRIPTION:

Utilise innovative concrete mixes that can reduce
the sites overall construction carbon footprint.

CONTROLS:

Limiting the project's carbon footprint by constructing the plinths using high strength 60MPa concrete with a design mix of 75% ground granulated corex slag in place of cement. 95% waste replacement was used in the 12 200m³ of 15MPa concrete used for the blinding beneath the bases. These initiatives reduced the wind farm's construction carbon footprint from approximately 300kg of CO₂/m³ to 90,7kg of CO₂/m³, reducing the project's estimated overall carbon footprint by 31%.





Environment

Concor aspires to Zero Harm in all aspects of its business including the natural environment in which it operates. Concor has established practices to prevent and mitigate pollution emanating from our industrial processes and this knowledge is expanded on and spread to all projects. We have developed critical environmental standards to ensure environmental performance against which risks and opportunities can be assessed and managed. In addition, we have developed several performance strategies to limit our use of or manage: water, energy consumption, process waste and prevention of pollution to water, air and land.



CLIMATE CHANGE

Concor acknowledges that climate change is a major threat facing us and we are committed to making a determined effort to operate in an ever more efficient and sustainable manner.

Concor conducts an annual review on its carbon footprint, to focus on areas to minimise its impact, Concor is also able to advise its clients on opportunities to minimise carbon emissions in the construction and mining industries.

Accreditations



Registrations



Memberships



Tel: +27 11 590 5500 Email: info.construction@concor.co.za

Address: HQ Bedfordview, 2 Arbroath Road, Bedfordview, 2007, South Africa

www.concor.co.za