

**PPG**

Working  
towards a zero  
carbon future

The PPG logo is displayed in white text on a dark blue rectangular background.

PPG is a platform of companies specialising in manufacturing precast concrete products. The platform includes:

Allen Concrete, manufacturers of precast concrete products for the fencing and building industries with operations in Surrey and Northamptonshire.

CCP Building Products, a supplier of concrete blocks and aggregates with four production facilities in the North West of England and North Wales.

Poundfield Precast, a leading manufacturer of precast concrete products. The company has been recognised as being “innovators in concrete”.



PPG is one of the platforms within SigmaRoc PLC, a specialist quarrying group that invests, improves, integrates and innovates companies within the quarried materials space in Europe.

We invest in high quality quarries that allow us to extract low and high grade materials for use in construction, agriculture, environmental and industrial applications.

Our key strength is our decentralised operating model, complimented by constant operational improvement.

**6**  
platforms

**76**  
sites

**1,850**  
people

**1.3bt**  
minerals

The Sigma Roc logo, with 'Sigma' in white and 'Roc' in white on a dark blue background.

[sigmaroc.com](http://sigmaroc.com)

# Working towards a zero carbon future

The necessity to limit global warming to no more than 1.5°C above pre-industrial levels has been well documented and publicised. The science could not be any clearer. The world has to reduce CO<sub>2</sub> emissions to as close to zero as possible by the middle of this century.

The UK Government has committed to reaching net zero by 2050 and every business, organisation and individual has a part to play in achieving this.

Concrete is the most used material on the planet and as a consequence is a significant contributor of CO<sub>2</sub>. Up to 90% of greenhouse gas emissions associated with concrete are in the cement<sup>1</sup>. As a building material, concrete cannot be matched. But as the world's third highest source of man-made CO<sub>2</sub>, greener options have become of even greater importance.

As a major precast concrete manufacturer we recognise the contribution we can make to help our customers lower their carbon footprint and this is now our major driver within the business.

We hope you will join us on this important journey.

<sup>1</sup> Source: Low Carbon Concrete Group



# Our vision

Our aim is simple. We are committed to enhancing sustainability and reducing the environmental impact in the construction sector. We continue to develop our sustainable product range and since January 2022 every product we manufacture is now available in an ultra-low carbon concrete option.

The market is changing and understands the need to acknowledge, address and action a tangible approach to decarbonisation. We want to give architects, contractors and specifiers the choice of using an ultra-low carbon alternative to precast cementitious products.

We are changing the way the built environment specify precast concrete, and are helping to address the need for our industry to decarbonise at a rapid pace.

# Where we are today



**CAPABILITY TO  
REDUCE CO<sub>2</sub> BY  
UP TO 77%**

In February 2021 SigmaRoc's Precast Product Group (PPG) launched Greenbloc, the first ever cement-free alternative to Ordinary Portland Cement (OPC) blocks.

Greenbloc offers a full range of concrete blocks made from class 1 aggregates and Cemfree – a cement-free alternative to conventional concrete.

Manufactured to BS EN 771 – 3: (2011) and complying with Part E of the Building Regulations for Walls and Floors, Greenbloc is manufactured, stored and placed in the same way as conventional concrete blocks. With no compromise on strength compared to OPC blocks, it is suitable for all applications, including foundations, load bearing walls, internal leaves of cavity walls and partition walls. Available in three options – Greenbloc, Greenbloc Premium and Greenbloc Ultra.

Greenbloc is a game-changer for the construction industry and is an important step in the greening of both construction projects and the wider supply chain, as it has the capability to reduce CO<sub>2</sub> by up to 77% on a project compared to OPC.

## Marshalls

### Marshalls plc collaboration

In September 2021 Marshalls plc and SigmaRoc plc entered into a strategic collaboration to develop ultra-low-carbon technology within the concrete building materials sector. The aim is to share knowledge in the application of current technologies while working together to develop new low-carbon methods of production.

The collaboration brings together two like-minded businesses focused on developing low carbon alternatives in an increasingly environmentally conscious market. It will also represent a further step in SigmaRoc's journey to increase access to ultra-low-carbon construction products.



## Greenbloc

### Introducing Greenbloc - precast

Since January 2022, every product manufactured by Poundfield Precast – has been available in an ultra-low carbon option and is marketed under the name of Greenbloc.

Greenbloc also extends to bespoke solutions, and is manufactured at all sites across the country, providing the broadest geographical reach of any precast concrete product supplier in the UK, while also minimising carbon emissions throughout the supply chain.

Available in three options (Greenbloc, Greenbloc Premium and Greenbloc Ultra) we are providing the construction industry with real commercial solutions to reduce embodied CO<sub>2</sub> using our precast products.

Leading the way with ultra-low carbon precast concrete

At PPG we work with partners who are at the cutting edge of new technologies in reducing our carbon footprint. If you want to see how we might be able to help you with a forthcoming project do get in contact and draw upon our experience.

# Lowering the carbon footprint of concrete



Concrete is made up of aggregates, water, cement and air. Of these four ingredients, aggregates make up the largest amount of volume and fortunately are low in embodied carbon.



However, cement has the highest embodied CO<sub>2</sub>, and this is where the focus has been to find alternatives to OPC (Ordinary Portland Cement), to reduce the carbon footprint of this important building material.

Reducing our carbon footprint in construction can be achieved in various ways, whether that be in using cement-free options, by partial CEM 1 replacement or considering different reinforcement solutions.

Currently, within British standards there are a number of ways to reduce embodied carbon by reducing the percentage of clinker in a mix. The use of ground granulated blast-furnace slag (GGBS) for example, instead of clinker, can have a significant effect on lowering embodied carbon. CEM III/B contains up to 80% GGBS and has a 73% lower embodied carbon than Portland Cement (CEM I).

# Ultra-low carbon cement-free concrete



**EMBODIED CO<sub>2</sub> THAT  
IS UP TO 80% LOWER  
THAN OPC-BASED  
CONCRETES.**

At the moment, the greatest reduction in embodied carbon can be achieved using cement-free concrete, utilising an Alkali Activated Cementitious Material (AACM). These alternative binders to OPC are typically produced from widely occurring natural materials or industrial by-products such as GGBS and PFA. The resulting binder is comparable to OPC in strength development and durability. Replacing 100% of the OPC with a cement-free binder results in an embodied CO<sub>2</sub> that is up to 80% lower than OPC-based concretes.

However, currently the use of AACMs is not included in BS 8500 but the Green Construction Board's Low Carbon Concrete group is advocating for a new British Standard for AACM or an update to PAS 8820. If this occurs then this will enable the use of AACMs to become a significant player in the drive towards ULCC, and will create even more opportunities for Greenbloc - precast.

This does not affect Greenbloc building blocks which meet all current standards required.

# What reductions are possible?

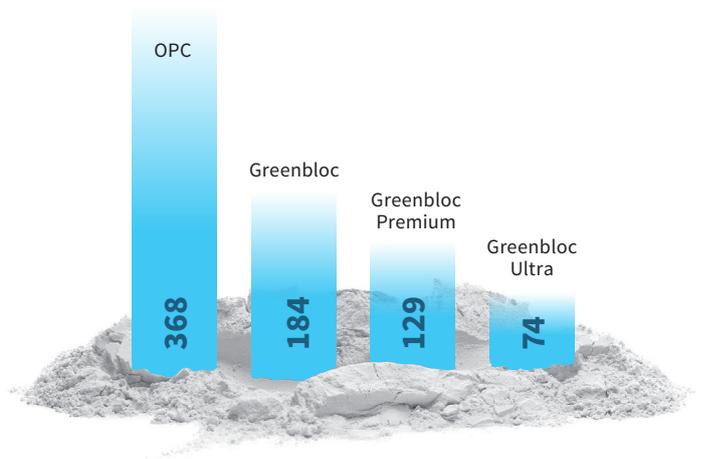
On a recent project we've been involved in, by trialling and evaluating various different mixes we were able to offer our customer savings of up to 80% in embodied carbon.

ULCC is now part of our mainstream production each day, working with companies such as Bastech for their basalt reinforcement, DB Group and Wagners (to name but two) for cement-free options, and partnering with Marshalls to utilise their laboratories.

These advancements have now allowed us to produce an ULCC mix which replaces OPC by up to 70%, yet still complies to British Standards, allows overnight strengths for demoulding, and delivers an 80% CO<sub>2</sub> reduction.

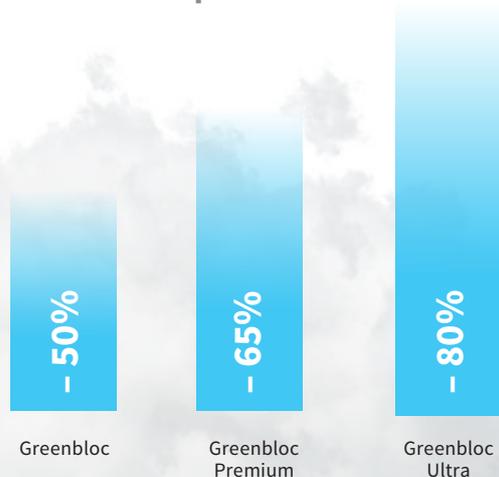
In other words, all the issues that have held back precast concrete being a viable option for a practical low carbon switch have now been eliminated.

## Embodied carbon Greenbloc - precast\* (kg CO<sub>2</sub>/m<sup>3</sup>)



\*depending upon manufacturing location

## % reduction in embodied CO<sub>2</sub> Greenbloc - precast



# Case studies

## Jackson Civil Engineering

Jackson Civil Engineering were named a Carbon Champion by the Institution of Civil Engineers (ICE). This celebrates their efforts to quantifiably reduce the carbon emissions associated with a project. The products supplied by PPG directly reduced the embodied carbon.

The precast concrete revetments, also known as Canewdon blocks, have been constructed using our ultra-low carbon concrete.

By using a cement-free alternative to traditional cement, savings of up to 78% in embodied CO<sub>2</sub> have been achieved compared to a conventional mix.

These particular Canewdon blocks are also reinforced using basalt rather than steel to further reduce the carbon footprint of the production.

The Canewdon blocks are used to support and protect riverside and coastal embankment slopes, and are designed specifically to absorb wave energy to protect the land.

The Environment Agency has committed to reducing embodied carbon in flood defence projects and our ULCC solutions can play a significant part.

*“Starting in 2021, we’ll use the lowest carbon concrete in our defences that meet our performance requirements.*

*More than half of our emissions come from our construction of flood defences”*

*The Environment Agency: Reaching net zero by 2030*



## Greenbloc - building blocks

In February 2021 PPG launched the UK's first cement-free ultra-low concrete building block under the brand Greenbloc. Concrete blocks are used extensively in the construction of real estate and infrastructure across all sectors. CCP's new Greenbloc range materially reduces the carbon footprint of these blocks when compared to a traditional product.

Greenbloc is completely cement-free, making it unique in the UK market and provides on average a significant net reduction in embodied CO<sub>2</sub> ('eCO<sub>2</sub>') of 77% per concrete block, resulting in the following specific decreases:

- an average reduction of 1.1kg of eCO<sub>2</sub> per concrete block;
- an average reduction of 2.7 tonnes of eCO<sub>2</sub> per average semi-detached house;
- these average reductions are equivalent to the CO<sub>2</sub> emitted by an average household's electricity consumption for four years.

Greenbloc has achieved Environmental Product Declaration ('EPD'), administered by The International EPD® System.

The EPD is classed as a type III environmental declaration with ISO 14025, and provides transparent and credible information about the environmental impact of a product throughout its lifecycle – from material extraction, through to manufacturing, useage and end of life.



## Blok 'N' Mesh

Blok 'N' Mesh is a market-leading manufacturer, supplier and installer of temporary fencing, site hoarding and barriers. Having worked in partnership with Poundfield for the manufacture of ballast blocks, used to support fencing and hoarding, it was keen to work with us as part of its sustainability strategy.

The ballast blocks have traditionally been made using a mix of OPC. Poundfield worked closely with Blok 'N' Mesh's technical team to develop a specific mix which resulted in the embodied carbon rating being reduced by 71% compared with traditional materials.



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