

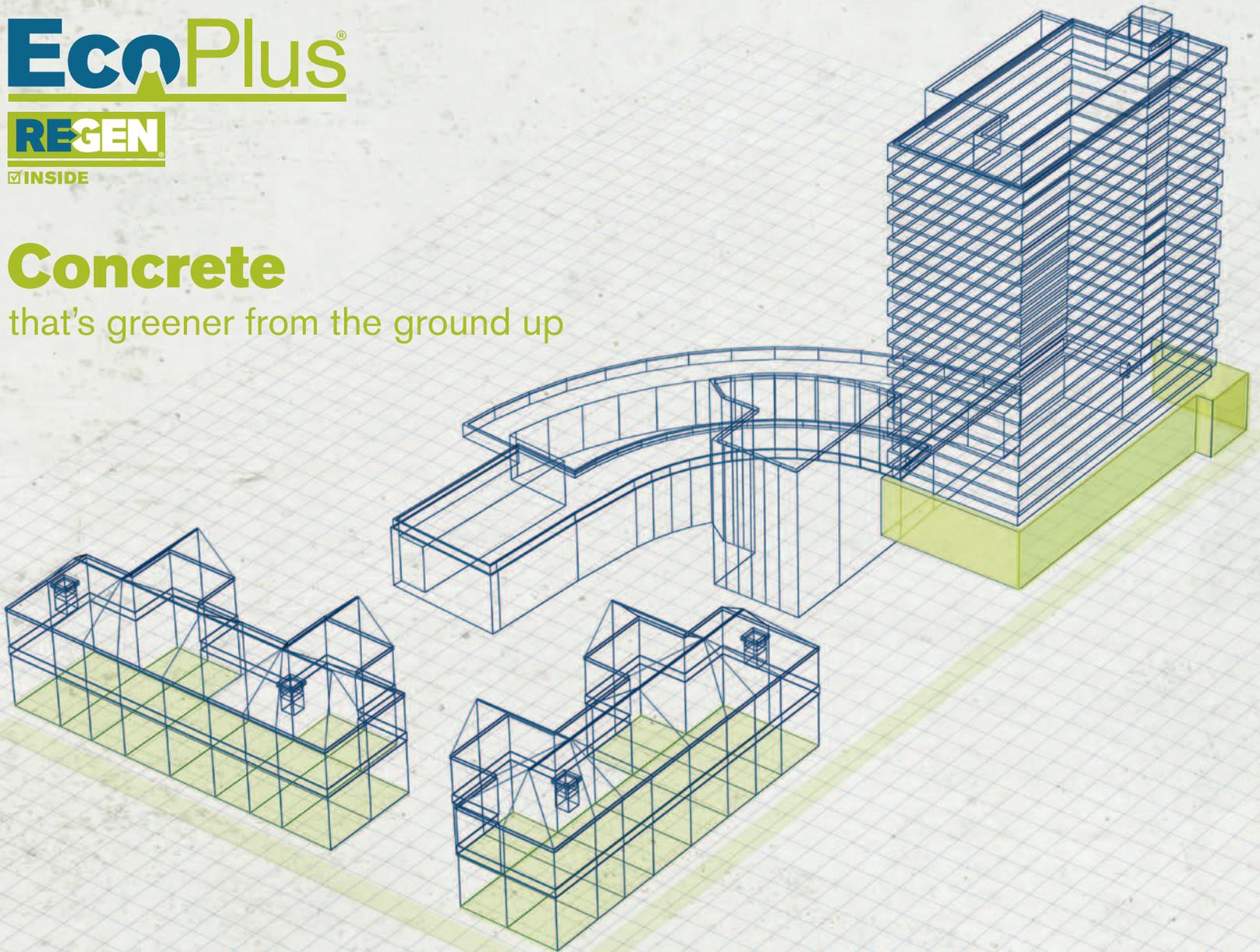
EcoPlus[®]

REGEN

✓INSIDE

Concrete

that's greener from the ground up





Concrete that's greener from the ground up

The EcoPlus range of high quality sustainable concretes is designed to help you meet current and future environmental agendas.

Being able to replace up to 70% of Portland Cement (CEMI) in a concrete mix with Hanson Regen (Ground Granulated Blast furnace Slag or 'GGBS'), we have developed a product that has a much lower level of embodied CO₂ than if ordinary cement was used. Hanson Regen, along with other environmental benefits, also improves the performance of the product, making it more durable and aesthetically lighter in colour.

EcoPlus makes specifying sustainable concrete easier as the type of application can be split into three simple categories:

EcoPlus Foundations

EcoPlus Pavements

EcoPlus Structural

Within each category you'll find mixes to suit most builds. And if you have a requirement that does not sit in any of the categories just contact our team and we'll seek to design a bespoke concrete solution for you, (see page 11).

All of our products in the EcoPlus range conform to BS 8500 and BS EN 206-1 standards.



**EcoPlus concrete mix with 70% Regen (GGBS)
was used in the turbine bases at the Clyde
Wind Farm adding sustainability and durability.**

Clyde Wind Farm, Scotland





Benefits

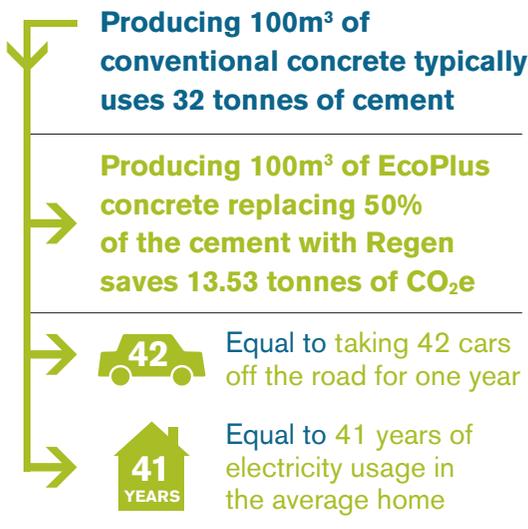
The Hanson EcoPlus concrete range benefits from the use of Hanson Regen, a cement substitute manufactured from a by-product of the iron-making industry. Replacing one tonne of Portland Cement with one tonne of Regen in EcoPlus concrete reduces the embodied CO₂e by around 850kg.

Sustainable

- Low CO₂ concrete
- No mineral extraction
- Reduced landfill
- Post-industrial by-product
- More sustainable than other cement substitutes such as Fly Ash (PFA)*
- Meets criteria for sustainable construction

Using Regen can significantly reduce the embodied carbon content of concrete, making EcoPlus a more environmentally friendly concrete option.

*The level of Regen in EcoPlus concrete can be as high as 70%, which is usually more than twice as much as other cement replacements such as PFA, which would typically be around 30%.



Concrete embodied CO ₂ e from Cement and Additions (kg/m ³)				
	CEM I	30% Fly Ash (PFA)	50% GGBS	70% GGBS
Total cementitious content	320	360	330	370
Portland Cement	320	250	165	110
Fly Ash	-	110	-	-
GGBS	-	-	165	260
Total cement and additions CO₂e	292	228	161	117

The table above shows the quantity of embodied CO₂e from the cement and additions in a typical C32/40 concrete.

Durable

- Will last longer, even in aggressive environments
- Less cracking by minimising the heat of hydration in mass concrete pours

In practice, concrete will deteriorate over time so durability is essential. The factors driving this deterioration can be internal (e.g. alkali-silica reaction) or due to external aggressive environments (e.g. sulfate attacks). EcoPlus (where specified correctly) is a more durable concrete that can better resist deterioration.

Attractive

- Lighter-coloured concrete
- Aesthetically pleasing
- Safer in dark areas



Manchester University

Calculations of embodied carbon content of concretes have relied upon the published values found in the MPA (Mineral Products Association) fact sheet 18 (Embodied CO₂e of UK cement and cementitious material).

EcoPlus concrete incorporating Regen is being used in a number of Canary Wharf projects.

Canary Wharf





Benefits

Heat of hydration

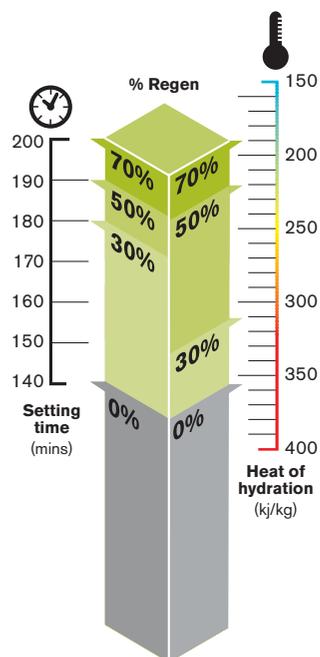
The hydration of cement is an exothermic reaction. The use of EcoPlus concrete reduces the heat of hydration. High temperatures in concrete can generate stresses that could result in early-age thermal cracking. This cracking is known to have caused issues with some structures, so the use of EcoPlus with Regen inside is recognised as an effective solution to the problem.

Minimising heat of hydration to reduce thermal cracking is of critical importance in mass concrete pours. A bespoke mix including high levels of Regen was used successfully in the construction of The Canary Wharf Box in London. The percentage of Regen used directly affects the heat of hydration; a replacement level of around 70 per cent is recommended for large pours. A temperature reduction of up to 40 per cent can be achieved with a 70 per cent replacement level.

Where EcoPlus concretes are used in mass sections, it is not unusual to stipulate strength conformity at 56 days to better allow for the maturing development of strength.

Setting times

As concrete using Regen (GGBS) benefits from lower heat generation, the product does take slightly longer to set. This is generally influenced by many factors, in particular temperature and water/cement ratio. However, an extended setting time does mean that the concrete will remain workable for longer and there will be less risk of cold joints. This is particularly useful in warm weather.



Easy to specify and order

- Order by type of application or a bespoke solution if required
- Conforms to BS 8500 and BS EN 206-1
- Available nationwide from all Hanson concrete plants
- Helpline for professional and technical advice

Guaranteed quality

- Aesthetically pleasing, lighter-coloured concrete
- Hanson is a member of the Quality Scheme for Ready-mixed Concrete (QSRMC) and all our products carry this certification



EcoPlus maximises the use of quality and sustainable materials such as Regen (GGBS). Excellent for use within aggressive ground conditions.



Canary Wharf Box, London

Reproduced by kind permission of Crossrail Ltd

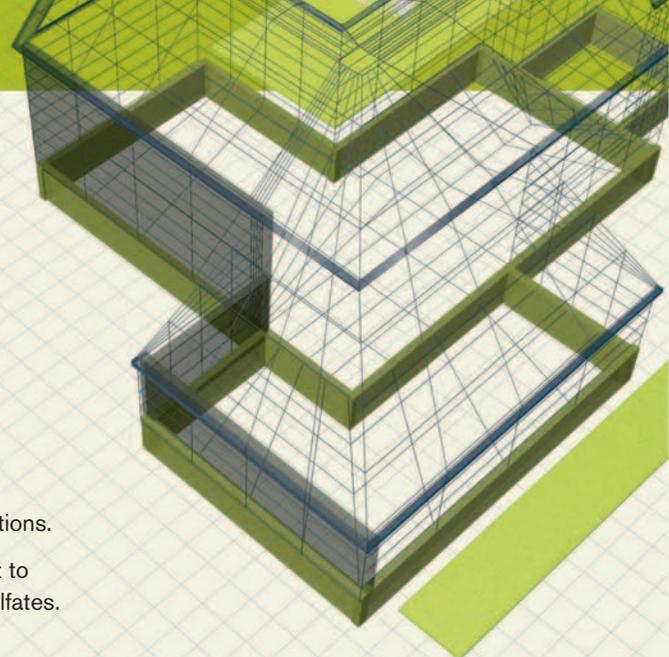


Foundations

Specifically formulated to produce the most sustainable and durable concrete solution for your foundations.

Sulfates occur naturally in the ground and can sometimes have a harmful effect on concrete, causing it to crack and disintegrate. The use of EcoPlus concrete gives greatly increased resistance to attack by sulfates.

We have used our expertise to create three EcoPlus Foundations options:



Mix 1

Where to use it

- Unreinforced mass concrete foundations
- Trench fill foundations
- Domestic garage, conservatory and garden wall foundations
- NOT suitable for pumping

The benefits

- Specially designed for foundations using at least 50% Regen substitute
- Easy to use, easy to place
- Complies with building regulations and British and European standards

CO₂e 27kg/m³
SAVINGS on mixes with 30% PFA

CO₂e 76kg/m³
SAVINGS on mixes with CEMI

Mix 2

Where to use it

- Unreinforced concrete foundations
- Suitable for pumping

The benefits

- Specially designed for foundations using at least 50% Regen substitute
- Easy to use, easy to place
- Complies with building regulations and British and European standards
- Complies with Design Chemical Class DC-2 to BRE Special Digest 1

CO₂e 51kg/m³
SAVINGS on mixes with 30% PFA

CO₂e 153kg/m³
SAVINGS on mixes with CEMI

Mix 3

Where to use it

- Unreinforced concrete foundations
- Suitable for pumping

The benefits

- Specially designed for foundations using 70% Regen substitute
- Easy to use, easy to place
- Complies with building regulations and British and European standards
- Complies with Design Chemical Class DC-3 to BRE Special Digest 1

CO₂e 138kg/m³
SAVINGS on mixes with 30% PFA

There is no CO₂e comparable for CEMI mixes as a concrete using CEMI in a DC-3 chemical class is not available.

Calculations of embodied carbon content of concretes have relied upon the published values found in the MPA (Mineral Products Association) fact sheet 18 (Embodied CO₂e of UK cement and cementitious material).

Pavements

For pavements and hard standings to provide a hard-wearing, highly durable and quality assured sustainable concrete. This product is specially designed for house drives and domestic pavements through to trafficked roadways.

We have used our expertise to create two EcoPlus Pavement options:

Mix 4

Where to use it

(cover limits to reinforcement and durability profile)

- External reinforced concrete for pavements and hard standing
- Cover to reinforcement greater than 35mm + fitting tolerance of 15mm
- Primarily house drives and domestic pavements
- NOT suitable for pumping

The benefits

- Specially designed pavement concrete using at least 35% Regen substitute
- Up to C25/30 concrete that complies with Exposure Classes XC2 for corrosion induced by carbonation for 50-year design life and XF3
- Air-entrained for superior freeze thaw resistance
- Easy to use, easy to place
- Complies with BS 8500:2

CO₂e 24kg/m³
SAVINGS on mixes with 30% PFA

CO₂e 70kg/m³
SAVINGS on mixes with CEMI

Mix 5

Where to use it

(cover limits to reinforcement and durability profile)

- External reinforced concrete for pavements and hard standing
- Cover to reinforcement greater than 30mm + fitting tolerance of 15mm
- Trafficked roadways

The benefits

- Specially designed pavement concrete using at least 35% Regen substitute
- Up to C32/40 concrete that complies with Exposure Classes XC4 for corrosion induced by carbonation for 50-year design life and XF4
- Air-entrained for superior freeze thaw resistance
- Easy to use, easy to place
- Complies with BS 8500:2

CO₂e 25kg/m³
SAVINGS on mixes with 30% PFA

CO₂e 100kg/m³
SAVINGS on mixes with CEMI



EcoPlus Concrete Carbon Calculator

Work out your CO₂e savings at
www.hanson.com/uk/ecoplus



Structural

A hardwearing, highly durable and quality assured sustainable concrete offering a stable finish for all your structural and above ground concrete needs.

We have used our expertise to create three EcoPlus Structural options:

Mix 6

Where to use it

- Reinforced concrete inside enclosed buildings with moderate humidity
- Cover to reinforcement greater than 25mm + fitting tolerance of 10mm
- Wearing surface – limited to light foot and trolley traffic
- Suitable for pumping

The benefits

- Specially designed for structural concrete using 50% Regen substitute
- Up to C25/30 concrete that complies with Exposure Class XC2 for corrosion induced by carbonation for 50 year design life
- Easy to use, easy to place
- Complies with BS 8500:2

CO₂e 61kg/m³
SAVINGS on mixes with 30% PFA

CO₂e 113kg/m³
SAVINGS on mixes with CEMI

Mix 7

Where to use it

- External reinforced vertical concrete sheltered from or exposed to rain
- Cover to reinforcement greater than 25mm + fitting tolerance of 10mm
- Internal wearing surface – general industrial
- Suitable for pumping

The benefits

- Specially designed for structural concrete using 50% Regen substitute
- Up to C32/40 concrete that complies with Exposure Classes XC3/XC4 for corrosion induced by carbonation for 50 year design life and XF1
- Easy to use, easy to place
- Complies with BS 8500:2

CO₂e 80kg/m³
SAVINGS on mixes with 30% PFA

CO₂e 130kg/m³
SAVINGS on mixes with CEMI

Mix 8

Where to use it

- External reinforced horizontal concrete subject to saturation and freezing while wet (from participating outlets) without de-icing agent
- Cover to reinforcement greater than 25mm + fitting tolerance of 10mm
- Internal wearing surface – heavy industrial (not foundry floors or busy public roads)
- Suitable for pumping

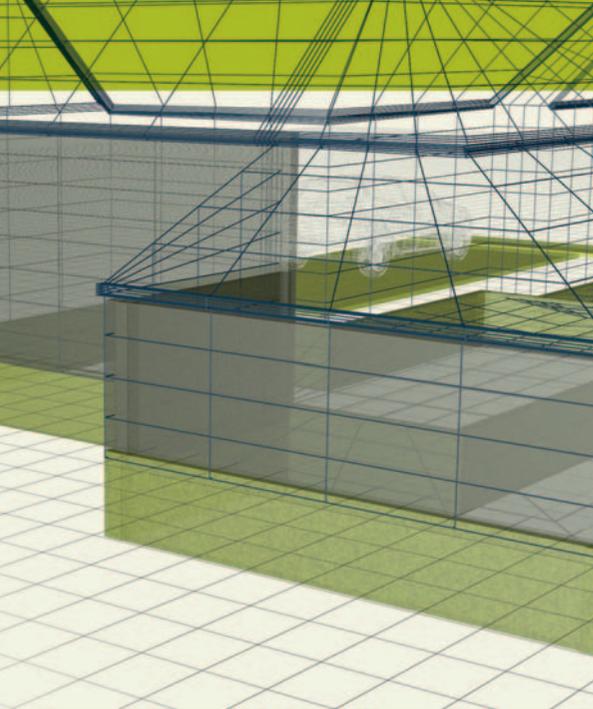
The benefits

- Specially designed for structural concrete using at least 40% Regen substitute
- Up to C40/50 concrete that complies with Exposure Classes XC3/XC4 for corrosion induced by carbonation for 50 year design life and XD1/XF3
- Easy to use, easy to place
- Complies with BS 8500:2

CO₂e 60kg/m³
SAVINGS on mixes with 30% PFA

CO₂e 109kg/m³
SAVINGS on mixes with CEMI

Calculations of embodied carbon content of concretes have relied upon the published values found in the MPA (Mineral Products Association) fact sheet 18 (Embodied CO₂e of UK cement and cementitious material).



Bespoke mixes

If you have a requirement that does not sit with any of our standard EcoPlus categories then just contact your local customer service office and our experienced technical team will help design a concrete solution suitable for your needs.

To discuss a bespoke mix, please contact the technical team at your local customer service office – see back cover for contact numbers.

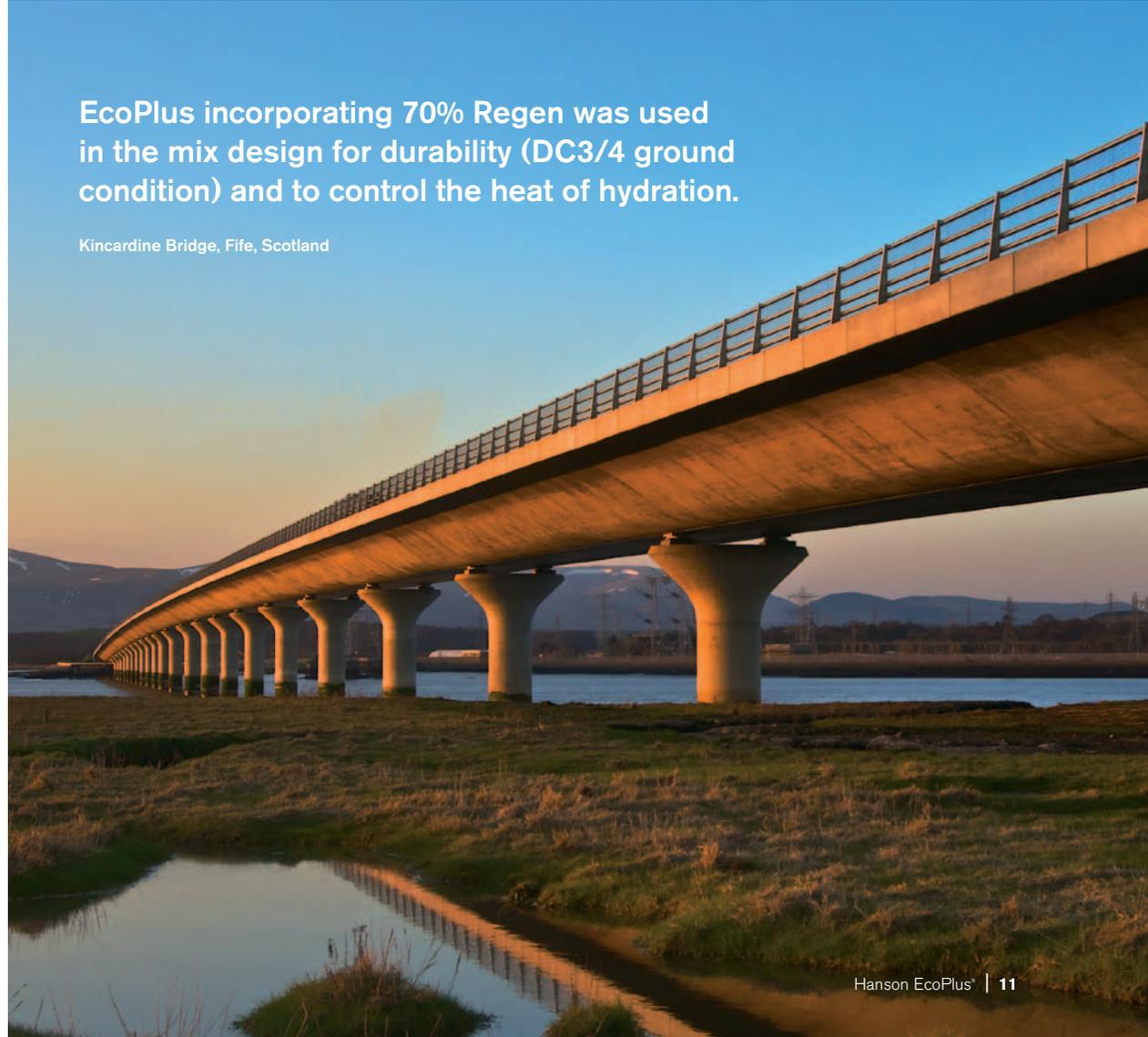


EcoPlus Concrete Carbon Calculator

Work out your CO₂e savings at
www.hanson.com/uk/ecoplus

EcoPlus incorporating 70% Regen was used in the mix design for durability (DC3/4 ground condition) and to control the heat of hydration.

Kincardine Bridge, Fife, Scotland



Case studies

Two exciting developments in London are taking place and both are benefiting from a sustainability and durability aspect through the use of Hanson's EcoPlus concrete in their construction.



First is the construction of a 20-storey building at 25 Churchill Place in London's Canary Wharf. For the Docklands, this tower is the last piece of a flourishing development that began in 1988 and has since transformed the area beyond recognition.

When complete the building will be approximately 130m high, with 23 floors, including over 51,100m² of office space and will incorporate four atria on the western elevation.

The other development right in the heart of the city is 20 Fenchurch Street, otherwise known as the 'Walkie Talkie' and the 'Pint' because of its bulbous top. The top heavy massing of this new iconic tower will also serve to hold a publicly accessible sky garden, making it London's highest public park.

When complete the building will stand approximately 177m high, with 38 floors, including over 60,400m² of office space together with an additional allowance for retail use.

Providing sustainability and durability

Both of these buildings have been designed to achieve a BREEAM 'excellent' environment performance rating, with 25 Churchill Place set to be one of the most environmentally friendly buildings at Canary Wharf to date. The use of EcoPlus concrete will play a big part in helping achieve this through the correct selection of its constituent parts.

The cementitious component of concrete represents most of the embodied carbon dioxide. Hanson is supplying both buildings with a high strength bespoke EcoPlus concrete mix containing up to 50% Regen as a cement substitute, thus significantly reducing the embodied carbon dioxide of the concrete mix. Regen generates very low CO₂ emissions, as is a post-industrial by-product.



Top and bottom left: 20 Fenchurch Street
Bottom right: 25 Churchill Place

Concrete Carbon Calculators

As a company that makes intensive use of raw materials, Hanson regards climate protection as one of the principle foundations of future development. Efficient production processes and the increasing use of alternative fuels and raw materials make an important contribution to this vision, as well as helping our customers manage and reduce their carbon footprint. To help achieve this Hanson have developed two carbon calculators.

EcoPlus Concrete Carbon Calculator

This EcoPlus specific carbon calculator is available online to help you calculate the amount of carbon you can save by using our EcoPlus concrete mixes.

Take a look at our easy to use, online EcoPlus Concrete Carbon Calculator at

www.hanson.com/uk/ecoplus

Calculations of embodied carbon content of concretes have relied upon the published values found in the MPA (Mineral Products Association) fact sheet 18 (Embodied CO₂e of UK cement and cementitious material).

Carbon calculator for all other Hanson Concrete products

This comprehensive carbon calculator enables us to give customers the carbon impact of any Hanson Concrete product, from any site. This includes manufacturing processes such as the inclusion of Regen but also a complete cradle-to-gate carbon calculation.

The Hanson carbon calculator helps customers to:

- manage the carbon footprint in their supply chain
- seek low carbon products
- understand the carbon impact of the products they buy

To get your product carbon footprint using our comprehensive carbon calculator, speak to the technical team at your local customer service office.

See page 15 for contact details



Other concrete solutions from Hanson



Like EcoPlus, our other ready-mixed concrete solutions have been specially developed for the civil engineering professional, each with its own unique qualities and characteristics.

Whether you're faced with difficult ground conditions, difficult applications or difficult access, Hanson concrete solutions have the answer. And all of these concrete solutions can have Regen mixed in.

EasyFill is a highly air-entrained concrete developed for trench reinstatement and void fill applications in various environments. It's a lightweight material produced by incorporating a powerful concentrated air entraining admixture into a base concrete or mortar.

Duracrete is a durable, high-performance concrete which can achieve strengths in excess of 100N/mm². The use of microsilica provides a dense structure and gives excellent chemical and abrasion resistance. Duracrete develops its strength very quickly and allows early use. High abrasion resistance means it can withstand heavy trafficking such as loading bays, while impact resistance and durability are also greater than conventional concrete. Duracrete is ideal for use in varied heavy industrial applications including warehouse floors, service yards, scrap yards, waste transfer stations and waste recycling centres.

EasyFlow is a self-placing concrete that offers huge benefits and cost savings by allowing placement of concrete in difficult situations. It is easy and quick to place, needs no vibration, and moves effortlessly through intricate or congested reinforcement, with no bleeding or segregation. This can mean a substantial reduction of labour and equipment. The faster, unassisted placing brings lower site costs and reduced risk and exposure to noise and vibration.

EasyFoam is a finely graded mortar, foamed to provide a low density material ideal for trench reinstatement, including void fill, insulation, cavity walls and non-structural applications. A lightweight material, it is produced by incorporating a pre-formed foam into a base mix of cement paste or mortar.

EasyPile is a unique product range that has been specifically formulated for piling concrete. The range consists of a mix specifically designed for CFA structural piling which can be used in all ground conditions but is particularly suitable in difficult areas where there is a high risk of damage to cages. The range also consists of mixes engineered for use in secant pile construction. Hanson's EasyPile concrete range offers the ideal solution to many of today's engineering challenges facing the piling and foundation specialist.

FastTrack is a range of high early-strength concretes which speed up construction by allowing quick release of formwork. It can save time, energy and money by ensuring production deadlines can be met with confidence, reducing the requirement for external heating and reducing production time and increasing productivity.

Fibrecrete is a polypropylene fibre-reinforced concrete which offers benefits in both the fresh and hardened state. When fresh, both bleed and plastic cracking are considerably reduced. The effect on early age tensile strength during hardening is also beneficial, and after hardening the fibres improve the toughness and general durability. One of its main applications is in pavement and floor slabs where crack control and durability are of particular importance.

Protect extends the life of structures and buildings by protecting the reinforcement within the concrete with a special corrosion inhibitor. It uses the latest technology within the mix design to extend the life of structures and buildings. Using a special multifunctional corrosion inhibitor, the reinforcement within the concrete benefits from an absorbed protective film which delays the corrosion process.

Watertight is a specially designed concrete which includes a pore blocking agent and a powerful new generation superplasticiser to provide extremely low permeability. The product, which is backed by a British Board of Agrément certificate, gives increased resistance to chemical attack and protection to the reinforcement and is also available in combination with EasyFlow as a self-placing, watertight mix.

NOTE: All the products in the solutions range must be handled, placed and cured properly to maximise performance. For best results, only trained concrete placers should be used.



→ EASY TO ORDER

Hanson EcoPlus is available nationwide from all Hanson Concrete plants. For a free quote or more information please contact your regional customer service office.



Scotland	0845 120 6300
North	0845 120 6300
Central	0845 845 6688
South	0845 758 5646
London	0845 120 5750



Email: concrete@hanson.com

To discuss a bespoke mix, please contact the technical team at your local customer service office using the above contact details.

Our companies and products

Hanson UK is the leading supplier of heavy building materials to the UK construction industry. We are split into three business lines – Hanson Cement, Hanson Building Products and Hanson Quarry Products. Hanson UK is owned by the HeidelbergCement Group, which employs over 53,000 people and operates worldwide. Hanson UK employs around 5,000 people across over 300 sites.

For detailed information on all areas of Hanson and our products visit: hanson.com/uk

Hanson UK products and services

Concrete

- Ready-mixed concrete
- Ready-mixed mortar
- Dry silo mortar
- Screed
- EcoPlus



Aggregates

- Sand
- Gravel
- Crushed rock
- Recycled aggregates

Asphalt

- Hot rolled asphalt
- Stone mastic asphalt
- Asphalt macadams



Contracting

- Highway maintenance
- Road surfacing
- Civil engineering
- Wind farm construction
- Waste to energy facilities
- MOD works

Bulk cement products

- Grey
- White
- Blends
- Regen (GGBS)



Packed products

- Cement
- Ready to use concrete, mortars, asphalt, aggregate and sand



Bricks

- Clay bricks and brick specials
- Clay pavers
- Bespoke clay products



Blocks

- Aircrete
- Aggregate



Precast concrete

- Retaining walls
- Culverts
- Barriers
- Floors
- Stairs
- Structural walls
- Basements
- Off-site solutions



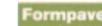
Cladding and render systems

- Cladding and render systems
- External Wall Insulation (EWI)
- Structural EWI
- Fastbrick



Other products and services

- SUDS
- Geothermal
- Roofing
- Chimneys
- Brick and block laying contractors



GreenBookLive



SMARTPHONE SCAN CODE

Hanson Concrete

Hanson House, 14 Castle Hill, Maidenhead, Berkshire SL6 4JJ

hanson.com/uk