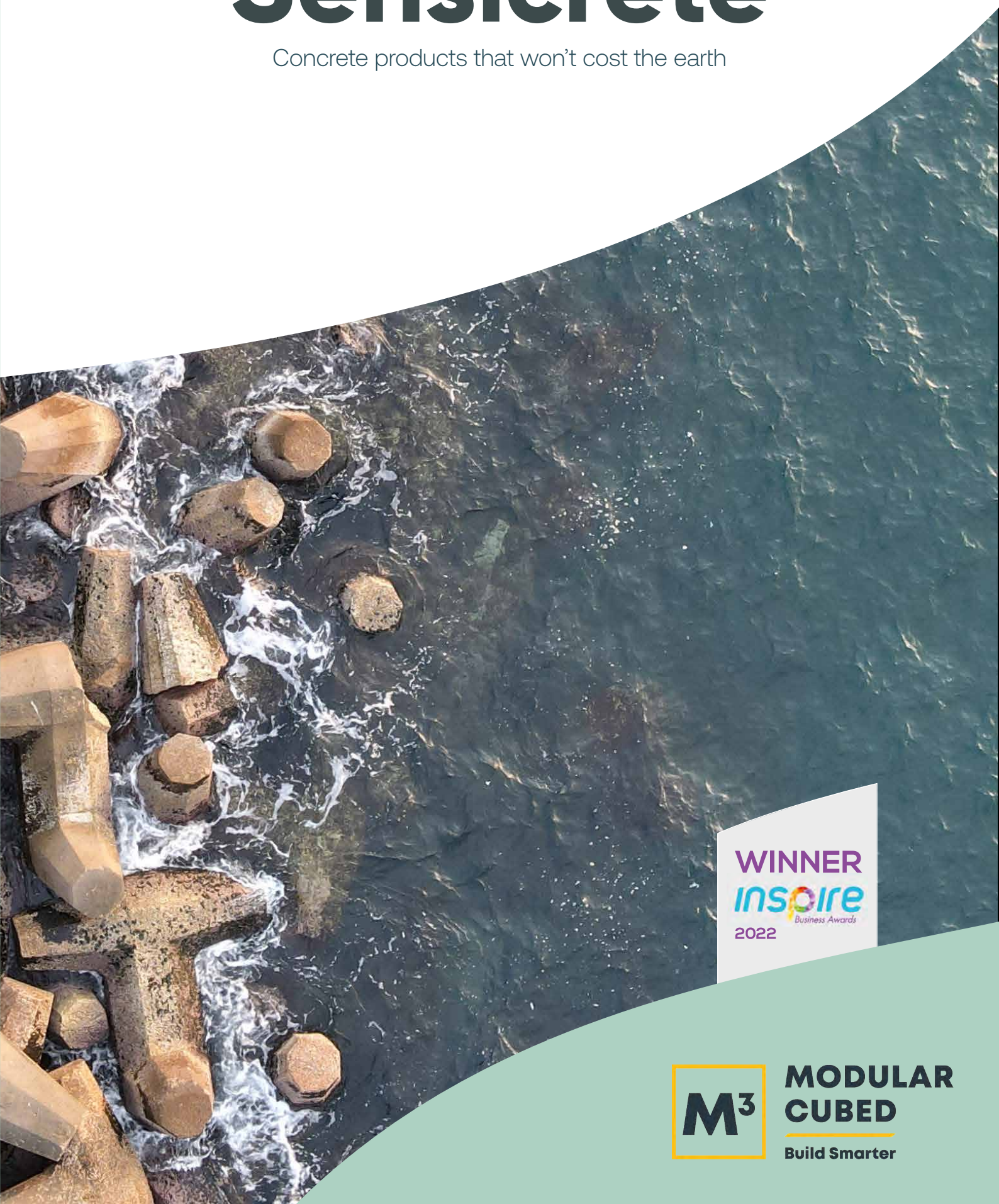
Sensicrete

Concrete products that won't cost the earth



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When it comes to manufacturing sustainable products, we know there's a lot more we can do than just reducing the cement in concrete. That's why we're looking at every way to drive down the environmental impact of our precast products.

We've been working with government agencies, world-class researchers and universities - from marine biologists to concrete chemists and renewable energy experts, pushing the boundaries of what's possible with precast construction.

We want to create the most innovative, planet-friendly solutions, and so far, we've developed three eco-enhancements:

1. **Sensicrete Low Carbon™ - lower the impact of concrete and make structures more durable**

2. **Sensicrete Self-healing™ - extend the life of concrete structures and reduce maintenance costs**

3. **Sensicrete Marine™ - eco-engineered resilient marine structures that promote biodiversity**

And this is just the beginning...

Sensicrete
Low-carbon

Reduce Carbon + Increase Durability.

Cement is responsible for an estimated 8% of global CO_2 emissions, so the less we use, the better. Our concrete mix can cut the amount of embedded carbon in retaining structures by half.

We use the lowest proportion of cement possible in our products so they'll still meet the standards for designing concrete structures. You can find lower cement content and even cement-free concrete mixes, but they're not yet compliant with Eurocodes.

CEM1 concrete mix contains an average of 505kg embedded CO_2/m^3	**Sensicrete™ CEM III/A concrete mix contains 245kg of embedded CO_2/m^3**

Using Sensicrete low-carbon we reduce the embedded carbon in our products and make them more durable.

In Marine environments

In Agricultural environments

GGBS lowers the alkalinity of concrete and increases its resistance to chloride

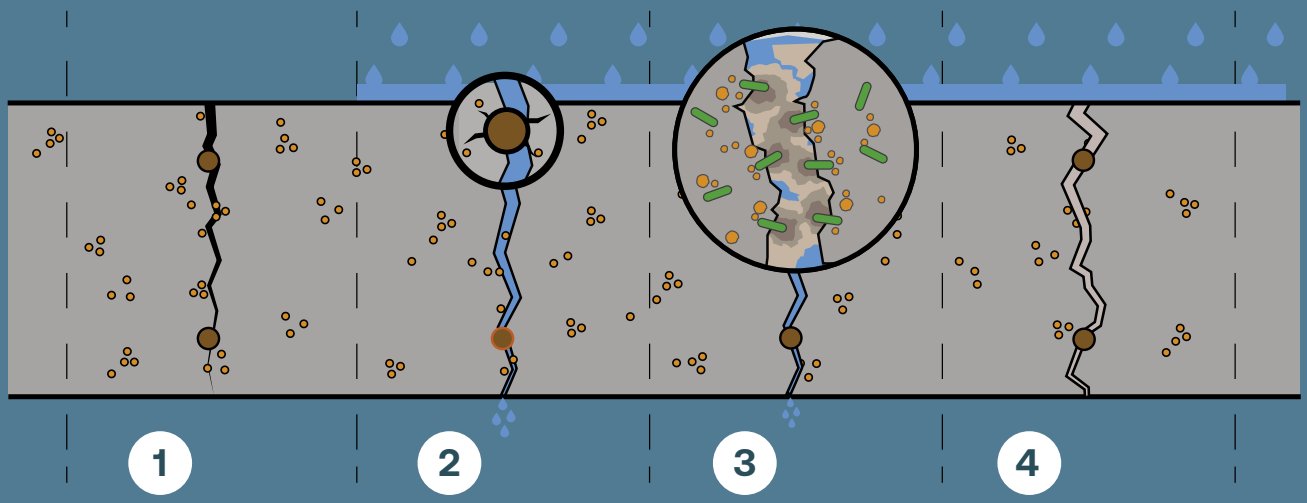
GGBS in concrete increases its resilience to silage effluent

Sensicrete **Self-healing**

The UK's first commercial bio-based self-healing concrete.

Powered by award-winning patented technology, our ultra-durable concrete increases the lifespan of structures and reduces the need for repair. By adding limestone-producing microbes to our concrete mix, cracks seal themselves.

How bio-concrete works



1

Concrete Cracks

It's not unusual to find cracks in reinforced concrete structures. These can be caused when stresses exceed the tensile strength of concrete.

2

Prevent Corrosion

Concrete cracks can result in leakage or corrosion to steel reinforcement. If the cracks are not repaired, it could weaken the structuture.

3

Self Healing

When the bacteria inside the self-healing agent comes into contact with water, it multiples and starts to produce limestone.

4

Cracks Repaired

The limestone fills the crack and seals the damaged area. Preventing any further leakage and protecting the steel reinforcement.

The benefits of self-healing

- Extend design life - Tests show that self-healing concrete can extend the lifespan of a concrete structure by up to 30%
- Save money - less need for repairs and fewer transport emissions
- Add durability - seals crack widths up to 0.8mm
- Reduce maintenance - increases water tightness, leads to 30-40% less maintenance
- Increase resilience - offers an extra layer of protection to reinforced structures in corrosive marine environments
- Design compliant - could enable reduction in steel reinforcement in line with BS EN1992-1-1:2005 and less concrete by reducing cover depth in line with BS EN 206

Concrete that senses cracks & seals them automatically

Sensicrete self-healing can be used in any concrete structure where exposure to water or moisture creates a risk.

Bridges **Coastal** **Tunnels** **Tanks** **Waterways**

Sensicrete **marine**

Resilient marine structures that promote biodiversity.

Concrete makes up over 70% of coastal and marine infrastructure - sea walls, breakwaters and tide pools help protect shorelines and low-lying land against erosion and flooding.

Building sea defences can feel like a trade-off between the safety of coastal populations and thriving, healthy seas. But it doesn't have to be.

Our precast products offer the best-of-both-worlds:

1. **Sea-safe concrete mix - increases resilience and durability of concrete structures in marine environments**

2. **Biomimicry designs - nature-inspired surfaces that encourage biodiversity and enable species to thrive**

Add our self-healing concrete into the mix, and you've got the perfect eco-engineered solution for long-lasting, hyper-resilient structures that protect coastal communities and give the environment a helping hand.

Marine-friendly concrete

We've altered the properties and design of concrete to make it more resilient in these corrosive environments and reduce its impact on fragile marine life.

Here are just some of the benefits of Sensicrete Marine:

- **Less intrusive to marine organisms - GGBS alters the alkalinity of concrete, making it more chemically balanced for use in marine environments**
- **More durable - GGBS makes concrete more sulphate and chloride resistant, resulting in greater durability underwater and delaying the onset of corrosion to reinforcement**
- **Design code-compliant - including: BS 8500, BS EN 206-1 & BS EN 1992**
- **Longer life span - self-healing additive maintains the integrity of structures, increasing their design life by up to 30%**
- **Less carbon - Replacing Portland cement with GGBS (in a retaining structure), can half the amount of embedded carbon in concrete.**

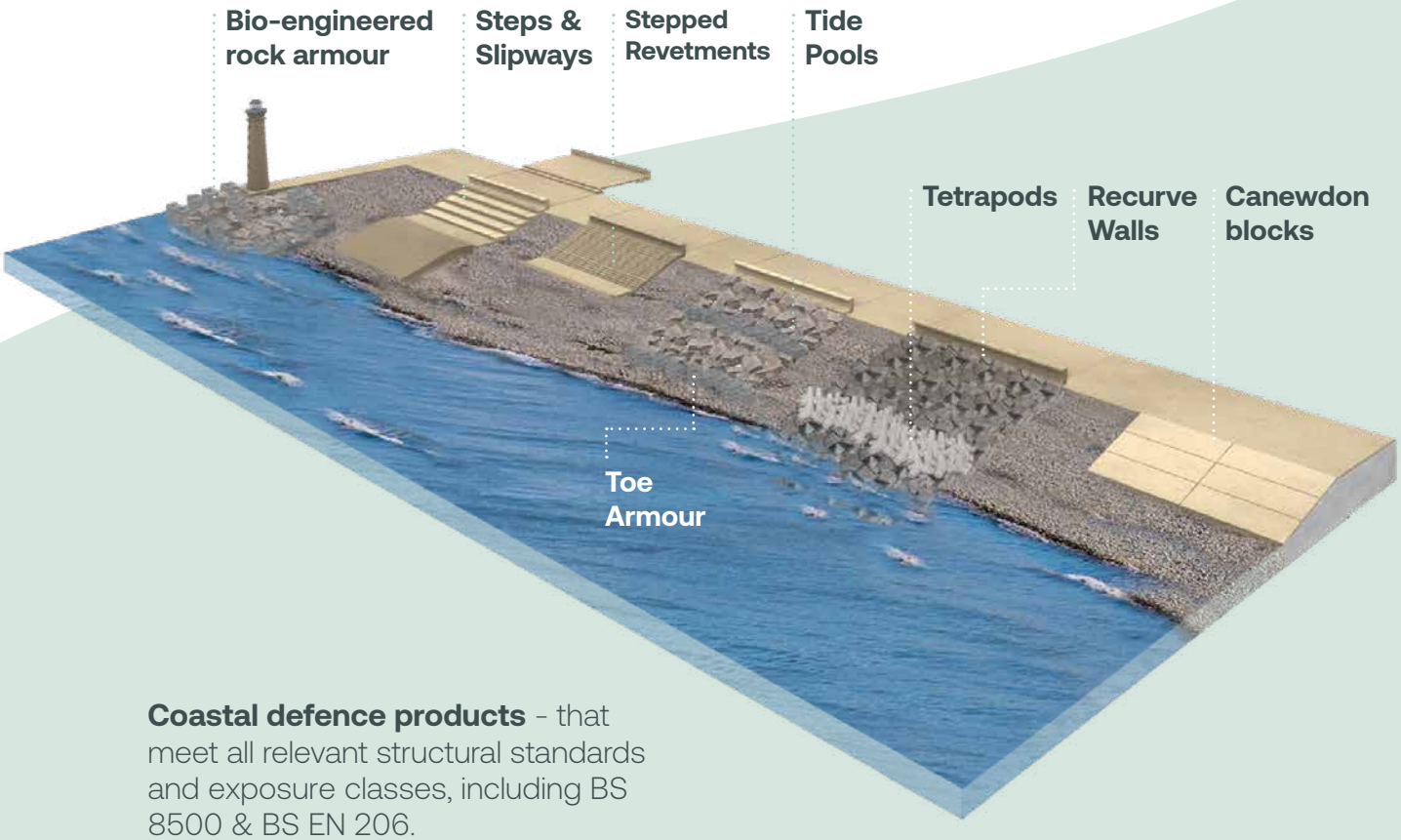
Designing with **nature** in mind.

We want to create surfaces on coastal defences that are inspired by nature. Using biomimicry designs (creating shapes and patterns that mimic nature), we can replicate marine habitats and help marine life to thrive in these artificial ecosystems.

1. **Offshore - a combination of tiny crevices and complex textures to encourage the growth of fauna and flora**
2. **Shoreline - a combination of tide pools, pits and grooves to create habitat for intertidal organisms**

Coastal defences

Our eco-engineered products mimic the appearance of their environment to create more suitable surfaces for colonisation by marine species and protect shorelines from erosion and flooding.



Coastal defence products - that meet all relevant structural standards and exposure classes, including BS 8500 & BS EN 206.

Off-site manufacturing - which reduces on-site delays and speeds up construction time. Helping you to get more done, quicker, using fewer resources.

Made-to-measure products - our precast products are eco-engineered to fit the project's needs.

Marine concrete - lowering the pH of concrete brings it closer to that of saltwater. This enables our submerged structures to exist in harmony with marine environments and encourages marine organisms to use sea defences as a habitat.

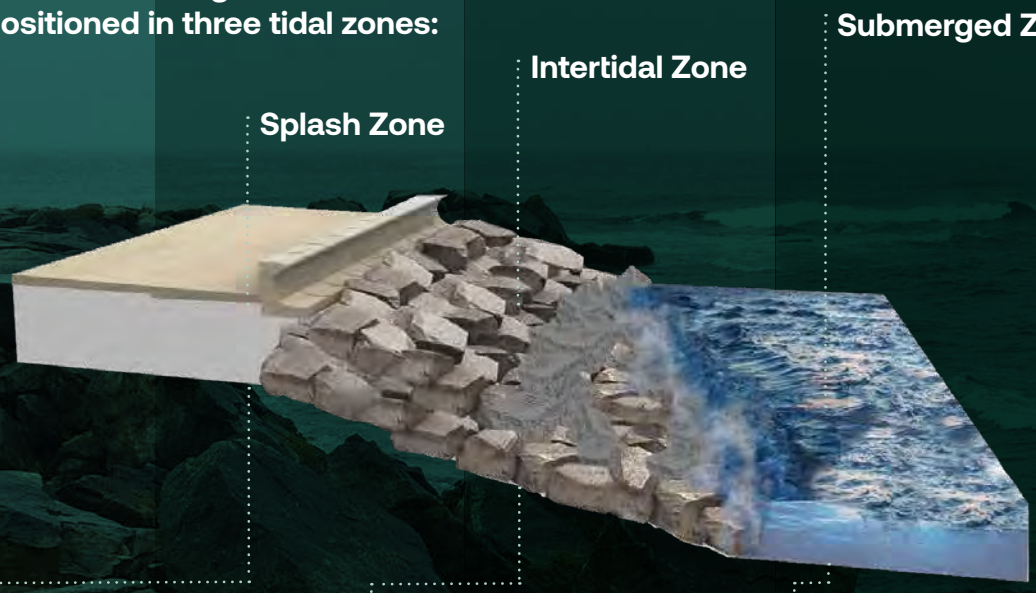
Biomimicry design - our structures are ecologically designed to mimic natural shoreline topography. This creates valuable habitats for native wildlife.

Corrosion prevention/protection - Our self-healing technology massively reduces maintenance costs.

Low carbon footprint - reduced CO_2 in structures is rapidly becoming not just desirable but demanded. Reduced carbon concrete is leading the way towards what will soon become an industry standard.

Tidal Zones

Structures along coastlines are positioned in three tidal zones:



Splash Zone	Intertidal Zone	Submerged Zone
Concrete is above the tidal zone and exposed to seawater spray	Concrete is between high and low tide zones and alternates being wet and dry	Concrete is constantly immersed in seawater
Sea defence walls in this zone are typically constructed with reinforced concrete and have a smooth surface	Breakwaters and groynes are typically constructed in this zone using rock armour and need to be able to withstand impact from waves.	Breakwater toes, off-shore wind farm foundations, marine ballast & moorings are below sea level and are more vulnerable to corrosion.
The constant spray from seawater and cracks in concrete put these sea walls at risk from corrosion. Using self-healing concrete, these structures will stay stronger for longer and maintenance-free.	Their smooth surfaces are inhabitable for marine organisms. Using artificial rock pools with biomimicry designs creates complex surfaces for local species to thrive. Adding Sensicrete's marine-friendly mix ensures these products won't harm marine organisms.	This zone has the greatest potential for promoting biodiversity as many organisms cannot endure long periods of air exposure. We create artificial habitats on precast blocks, so marine life can colonise.

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