

# Solutions for infrastructure

When subjected to the elements and environmental attack, even the most well designed structures, constructed using the best quality concrete, need repair and protection in order to ensure that the intended design life can be achieved.



**Factors such as carbonation, water penetration, chemical or chloride attack, and freeze/thaw cycling can all lead to significant deterioration of precast and in-situ concrete, quickly leading to corrosion of the steel reinforcement. It is therefore essential to carry out periodic maintenance in order to keep these structures in a serviceable and, above all, safe condition.**

## Impacts of a changing world

Concrete was once regarded as a low maintenance or maintenance-free material. In reality, structures which were originally created with an anticipated design life of 60, or even 120 years, can quickly show signs of degradation. In addition to aggressive environmental factors, there are increasing demands placed on modern infrastructure that can push the performance of concrete structures to the absolute limits.

## Solving structural problems

Older bridges and highway structures can often need urgent remedial

action to reinstate their structural integrity. In such instances, **Intercrete®** products provide a comprehensive refurbishment solution incorporating a full range of engineering quality mortars and high performance cementitious and anti-carbonation coatings.

**Intercrete** products have an impressive track record of international performance in some of the world's harshest conditions, spanning over 30 years. They have been successfully used to weatherproof airports, bus stations, tunnels, rail structures, roads and other infrastructure in highly demanding environments such as nuclear power stations and chemical facilities.

Our range of advanced repair and protection systems provide durable, engineered solutions to concrete repair problems. Structural integrity and the original design life can be restored, whilst the overall appearance of ageing concrete structures can be significantly improved with the **Intercrete** range of weatherproof decorative finishes.

## Engineered to perform

**Intercrete** concrete repair mortars have been designed to offer class-leading performance. They incorporate the latest cementitious and polymer technology to provide many important benefits:

- Excellent low sag properties enabling high build application in vertical, horizontal and overhead situations
- Exceptionally high bond and tensile strength
- Low permeability to water, even at 10 bar negative pressure
- Quick to install and non-toxic when cured



Intercrete repair solutions are chosen because of their reliability and proven performance

# Concrete repair and protection challenges for infrastructure



Intercrete cementitious technology is regularly applied to solve challenging structural problems experienced by concrete infrastructure.

## Corrosion of reinforcement

**Problem:** Due to carbonation, localised corrosion of the reinforcement can occur, resulting in spalling of the concrete cover. If left untreated, the design life of the structure can be shortened significantly.



Intercrete 4800 can be applied up to 80mm thick in a single layer

**Solution:** Following removal of unsound concrete and preparation of the steel, **Intercrete 4871** is applied by brush. Missing or removed concrete can then be reinstated using **Intercrete 4800**, a high build structural repair mortar. Afterwards, **Intercrete 4822** may be applied to all surfaces using a bag rubbing technique to achieve a fair-faced finish, prior to the application of an anti-carbonation coating such as **Intercrete 4891**.

## Reinstatement of runways and bridges

**Problem:** Roads, runways and bridges are often subject to heavy wear, and cannot be taken out of service for long periods of time. Repairs to voids or worn trafficked surfaces require a fast-track, high strength solution.



Intercrete 4802 is extremely quick-setting, enabling rapid return to service

**Solution:** Where speed of reinstatement is important, all voids and removed concrete should be reinstated with **Intercrete 4802**, a shrinkage compensated, polymer modified, Portland cement based concrete repair mortar. **Intercrete 4802** sets in just 10 minutes and, when bulked out with aggregate, achieves a strength of over 30N/mm<sup>2</sup> in just 2 hours. As an additional friction wearing course, **Intercrete 4851** can be installed at a thickness of 2mm.

## Chloride ingress

**Problem:** Chloride attack can severely damage bridges and other reinforced concrete structures that are exposed to de-icing salts. The result can be extensive corrosion, loss of steel section and large areas of spalled concrete.



Intercrete 4841 conforms with Highways Agency Specification Clause 1770

**Solution:** **Intercrete 4841** is a polymer modified waterproof coating that provides exceptional protection against water ingress, chloride attack and carbonation. It is quick, simple and safe to apply without the need for a primer, ensuring that any disruption is kept to a minimum. Independent tests prove that **Intercrete 4841** continues to provide an effective barrier to moisture, chloride ions and carbon dioxide after well in excess of 27 years.

## Lining of concrete bunds

**Problem:** Concrete bunds often surround storage tanks containing highly hazardous chemicals. To ensure their structural integrity and eradicate the risk of harm to the environment, a chemically resistant lining is required.



Intercrete 4840 resists water, chloride ions and aggressive chemicals

**Solution:** **Intercrete 4840** provides a highly effective solution for waterproofing and protecting chemical bunds. Applied by brush or spray, it cures rapidly to form an exceptionally tough, chemically resistant finish and, with a water-based formulation, no hazardous solvents or heavy odours are released during application. **Intercrete 4872** can also be embedded into the coating over live cracks and expansion joints, providing permanent elasticity.

# Motorways and highway structures

The pressure to provide safer, less congested travel for motorists poses ever more engineering challenges. The durability of both new and existing highways structures must be assured by using materials capable of achieving the required design life.



**Reinforced concrete structures are common on motorways and highways but their durability is constantly threatened by exposure to chloride attack from de-icing salts, as well as freeze-thaw attack, water ingress and carbonation. Engineers need to use the most advanced materials available to reinstate the integrity and durability of these structures, whilst also meeting the current and future demands of our ever-evolving highway infrastructure.**

## Assuring structural integrity

**Intercrete®** has spent over 30 years developing a comprehensive suite of materials that are regularly specified by Highways Agencies and local authorities for reinstatement and protection projects. Incorporating the latest cementitious and polymer technology, **Intercrete** products are proven to perform in even the most demanding situations and offer rapid, straightforward application. They are also CE Marked in accordance with BS EN 1504

and meet the high performance standards required by Highways Agency Specification Clause 1770.

**Intercrete** offers practical, economic solutions which meet the needs of both existing motorway structures and new construction developments. This includes the latest SMART motorway schemes and other widening projects which are being introduced to manage increasing levels of traffic and congestion. Such schemes may involve alterations to existing structures as well as new construction (e.g. gantries) which may require low cover issues to be addressed or additional chloride protection in order to reinstate their durability.

## Minimising disruption

With environmentally friendly, water-based formulations, **Intercrete's** range of engineered products enable repair and protection projects to be carried out in a sustainable, long-term manner. What's more, they are quick and easy to apply direct to concrete without the need for a primer, ensuring that minimal disruption is caused to motorway users.

## One-stop solution

**Intercrete** provides a comprehensive range of engineering quality mortars and high performance cementitious and anti-carbonation coatings. They are perfectly suited to reinstating and protecting a wide range of motorway and highway structures, including:

- Gantry and vehicle restraint barriers
- Overbridge decks and concrete elements
- Concrete hard shoulder areas
- Transit and freight rail bridges
- Drainage kerbs and channels
- Culverts and retaining walls
- Foot bridges and cycle bridges



Intercrete repair and protection solutions are ideal for use on SMART motorway construction

# Keeping our motorway and highway network moving



Intercrete's innovative solutions help to maintain a safe, efficient and reliable road network, which in turn can help cut both costs and congestion.

## SMART motorways and new construction

**Problem:** SMART motorway upgrades and widening schemes can reveal areas of low cover which require remedial work. If untreated, this can cause chloride ingress which can severely compromise the intended design life.



Intercete 4841 effectively reinstates cover and protects from chlorides

**Solution:** The **Intercete** range of cementitious coatings and technical mortars is ideally suited to reinstating the durability of reinforced concrete in order to ensure that the design life is achieved. **Intercete** products are totally impermeable to water and have excellent resistance to both chloride and carbon dioxide ingress. A 2mm coating of **Intercete 4841** provides the equivalent of 100mm of good quality concrete cover.

## Repairs to decks, kerbs and channels

**Problem:** Structural repairs and refurbishment are often required on trafficked concrete decks, as well as drainage kerbs and channels. A reliable, fast-setting material is required in order to minimise disruption to road users.



Intercete 4802 sets 10 minutes, achieving a final strength of over 60MPa

**Solution:** Trafficked areas can be quickly repaired and strengthened using **Intercete 4802**. This rapid hardening, fibre reinforced, polymer modified repair mortar is based on Portland cement technology and achieves a compressive strength of 14MPa in just 1 hour at 20°C. It can also be used to reinstate concrete prior to surface dressing with asphalt or a waterproofing membrane, allowing the road to be rapidly returned to service.

## Concrete repair and protection

**Problem:** Reinforced concrete elements on bridges and other highway structures are exposed to an aggressive environment whereby the passivating layer around the steel is broken down leading to corrosion and spalling.



Intercete 4891 has an anticipated lifespan of at least 15 years

**Solution:** **Intercete 4801** is a structural repair mortar, CE Marked to EN1504-3 and compliant with the requirements of with Highways Agency Specification BD27/86. Its physical characteristics are similar to bridge quality concrete and it can be built up to 80mm even on soffits. **Intercete 4891** is a high performance coating that provides a decorative finish with excellent protection from carbonation and ingress of chlorides from salt-spray.

## Protection from de-icing salts

**Problem:** Bridges and other reinforced structures that are exposed to de-icing salts can be severely damaged by chloride attack. This can cause extensive corrosion, loss of steel section and large areas of spalled concrete.



Intercete products meet Highways Agency Specification Clause 1770

**Solution:** **Intercete 4841** offers exceptional protection from chloride ion ingress and is ideal for use on both new and existing structures. Independent tests have confirmed that it will provide an effective barrier to chlorides for at least 27 years. **Intercete 4841** also provides outstanding resistance to freeze-thaw cycling, and its innovative formulation allows the product to behave in a similar manner to the parent concrete.