



Repair and Protection of concrete structures

Programme overview

Preserving concrete structures with StoCretec

Repair and protection solutions

There can be many different reasons for carrying out a concrete repair.

A repair is always required when the look or function of building elements or structures, made from concrete or reinforced concrete, deteriorates.

Design factors, usage and environmental factors that are detrimental to concrete can result in serious damage. Intelligent systems and solutions are therefore required in order to repair the function and appearance of the building elements, or structures, and provide long-term protection.

This brochure gives an overview of the StoCretec product portfolio for the protection and repair of steel reinforced concrete structures.

Whether it is a building, bridge, tunnel, wastewater treatment plant or power station, StoCretec systems and product solutions are perfectly customised to suit any area of application.

To make things simple, the solutions are divided into four application fields:

- Property management
- Traffic
- Energy
- Nature and resources



Property management

Property management includes product and system solutions for the protection and repair of concrete structures such as industrial, administrative and residential buildings.

All products assigned to this application combine high cost-effectiveness and maximum application efficiency.

Products according to EN 1504

The EN 1504 series of standards "Products and systems for the protection and repair of concrete structures" has been in force since 1 January 2009. EN 1504 ensures quality of product, selection of the correct repair method and quality of application. All StoCretec products comply with the specifications and test criteria of this standard.





Transport

Transport applications require checked and tested repair systems that meet the stringent requirements of traffic engineering and construction. This area of application focuses on the repair and protection of bridges and tunnels.

Typical solutions can include hand-applied repair systems, flowable mortars and spray mortars for reinstating damaged areas.

Long-term protection can be added using coatings or hydrophobic impregnations to exclude damaging influences such as carbon dioxide, moisture and salt.

Finally, the load bearing capacity can be assured or improved with the use of carbon fibre plate or wrap.



Energy

Exposed structures, such as power plants or dams, must be able to withstand extreme loads. Their construction requires suitable systems for surface protection from the very start.

Structures, such as cooling towers, are subject to immense stress. Aggressive pollutants can also damage the building fabric. For this reason, both preventative protection and sustainable repair measures are required.

The StoCretec product range for this application is perfectly customised to meet high standards, whether an existing facility is being refurbished or a new building under construction.



Nature and resources

The refurbishment of facilities for waste and water management represents a particular challenge where the aim is to optimise quality, cost-effectiveness, and environmental protection.

Concrete structures in sewage plants can sometimes be exposed to particularly aggressive environments. On the one hand, there are general stresses and strains – including frost with or without deicing salt, and carbonation – on the other hand, there are specific chemical threats, such as biogenic sulphuric acid corrosion.

The extensive StoCretec programme for the protection and repair of concrete structures in sewage plants is evidence of many years' experience and special expertise.



Three Key Products from StoCretec

Faster application and curing, providing optimum efficiency and quality

Fast

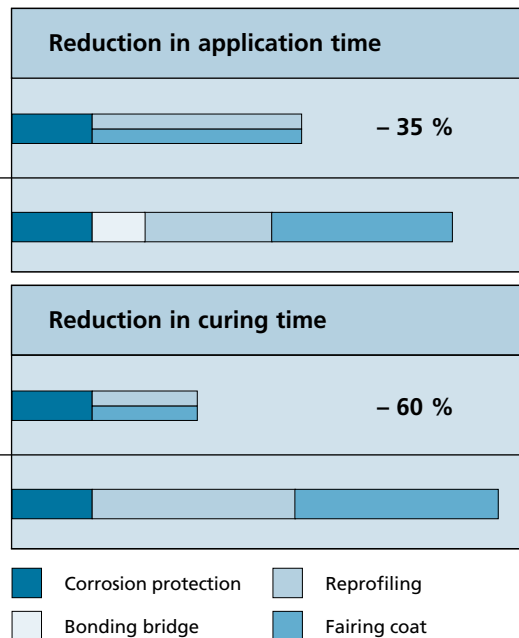
One product covers multiple application stages. No bonding bridge is required and with StoCrete SM P there is no waiting for corrosion protection to be applied and to cure. Coatings or fairing coats can be applied just 4 hours after the repair has been made.

Simple and Efficient

One product only - no need for ordering and stocking of corrosion protection, bonding bridge or additional fairing coat. One single application step simplifies the repair process and means each repair location is completed in a single visit.

A Quality Repair

One single application step removes complexity and reduces the possibility of application errors. With their first class application properties, StoCrete SM, SM P and RM F offer excellent non-sag filling of repairs, whether it's in the wall, on a corner or overhead, and can be easily finished to a high standard. When used as a fairing coat, application is also easy and light with a smooth, professional sponge-floated finish.



StoCrete SM

Combined fast-curing repair mortar and fairing coat requiring no bonding bridge. Conforms to EN 1504-3 with a compressive strength of 28N/mm². Apply to 100mm+ over small areas, 3-40mm over large areas. Ideal for vertical or overhead concrete repairs where there is no exposed reinforcement or combined with corrosion protection such as StoCrete BE. Use as a fairing coat over larger areas at a depth of 3mm. Available in a 25kg sack or resealable 10kg pail that's ideal for occasional use with no waste.



StoCrete SM P

Combined fast-curing repair mortar and fairing coat with integrated corrosion protection. No bonding bridge or corrosion protection required. Conforms to EN 1504-3 with a compressive strength of 25N/mm². Apply to 100mm+ over small areas, 3-40mm over large areas. Ideal for vertical or overhead concrete repairs that involve exposed reinforcement. Use as a fairing coat over larger areas at a depth of 3mm. Available in a 25kg sack



StoCrete RM F

Fast-curing floor repair mortar, no bonding bridge required. Conforms to EN 1504-3 with a compressive strength of 40-50N/mm². Impermeable to water and highly resistant to freeze-thaw and chloride ingress. Ideal for small area floor repairs, creating fillets and laying to floors, creating small ramps, etc. Apply to a depth of 2-40mm. Available in a 25kg sack or resealable 10kg pail that's ideal for occasional use with no waste.



Concrete Renovation Systems

Re-establishing the status quo

Concrete Repair from StoCretec

Manually placed concrete repair systems have to be closely matched to the properties of the existing concrete. That is why StoCretec are able to offer a variety of systems, all compliant with EN 1504. From StoCrete SM or SM P, to the StoConcrete Repair Prime XA system which is class R4 and resistant to chemical attack.

All of our systems provide corrosion protection to the reinforcing steel, a bonding bridge to the substrate (if required), repair mortar to replace what has been removed, and reinstate the passivating alkali environment. A variety of fairing coats to provide a smooth finish and add to the carbonation protection can also be supplied.

Optimised for fast, reliable application

Every component in the StoCretec systems has been designed to provide tangible benefits and ease of application.

StoCrete BE - corrosion protection and bonding bridge in one material. This dual functionality simplifies your ordering and stocking process and

helps ensure you always have the correct material ready to go. StoCrete BE not only serves as cement-rich corrosion protection for reinforcing steel, but can also be used wet as a bonding bridge when required.

StoCrete TF 200 and TF 204 fairing coats provide not only the usual smoothing function but are also tested in their own right to EN 1504-2 and are therefore proven to also keep CO2 and moisture at bay. Most StoCretec repair mortars and fairing coats can also be spray applied giving you an additional option if you suddenly need to repair a large area or to speed up the repair of multiple smaller areas.



Overview of mortars

		Properties			Application			
	Product name	Max. 28 day compressive strength	Classification according to EN 1504-3	Layer Thickness	Vertical	Overhead	Hand Application	Machine Application / Pumpable
Hand-applied Repair Mortars	StoCrete GM	45 MPa	R3	6-30mm	●●	●	●●	
	StoCrete TG 203	65 MPa	R4	6-30mm	●●	●●	●●	
	StoCrete TG 204	55 MPa	R4	12-50mm	●●	●	●●	●●
	StoCrete TG 252*	58 MPa	R4	6-30mm	●●	●	●●	
	StoCrete TG 254*	58 MPa	R4	12-50mm	●●	●	●●	
Fairing Coats	StoCrete FM	30 MPa	R2	2-5mm	●●	●	●●	●●
	StoCrete TF 200	45 MPa	R3	2-5mm	●●	●	●●	●●
	StoCrete TF 204	21 MPa	R2	1-3mm	●●	●	●●	●●
	StoCrete TF 250*	42 MPa	R3	2-5mm	●●	●	●●	●●

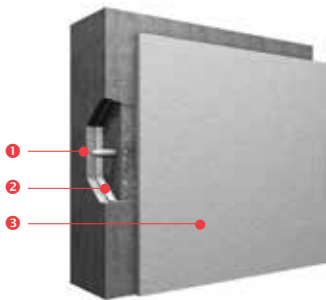
●● excellent ● good

* Sulphate resistant

StoCrete Hand Applied Concrete Renovation Systems

For durable, reliable repairs to all structures and environments

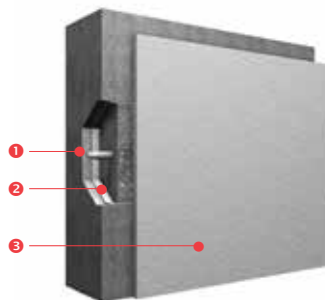
StoConcrete Repair Classic
- ideal for repairs to buildings.



- 1 StoCrete BE corrosion protection
- 2 StoCrete GM repair mortar
- 3 StoCrete FM, TF200 or TF204 fairing coat

StoConcrete Repair Classic is simple and economical. It comprises StoCrete BE for corrosion protection and StoCrete GM, an advanced Polymer Cement Concrete. StoCrete GM offers high build with low slump and no bonding bridge, giving you additional time and money savings. Finally a choice of fairing coats for a smooth and professional finish are available.

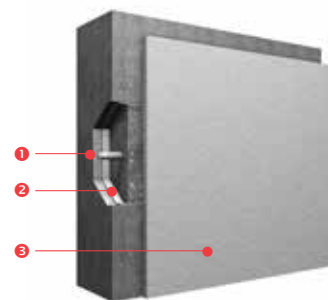
StoConcrete Repair Prime
- for civil structures when only the strongest will do.



- 1 StoCrete BE corrosion protection and bonding bridge
- 2 StoCrete TG203 or TG204 repair mortar
- 3 StoCrete TF200 or TF204 fairing coat

StoConcrete Repair Prime has been tried and tested on countless buildings, bridges, and other highway structures for many years and across many countries. An R4 class system, compliant with EN 1504, StoConcrete Repair Prime offers strength, durability and security. Options within the system allow for high build with fairing coats that provide smooth, pore-free surfaces. Particularly outstanding is the workability and ease of application of all the system components that can also be spray-applied if required.

StoConcrete Repair Prime XA
- for strength and durability in chemically aggressive environments.



- 1 StoCrete BE corrosion protection
- 2 StoCrete TH250 bonding bridge
- 3 StoCrete TF250 fairing coat

StoConcrete Repair Prime XA has been developed for application in chemically aggressive environments such as waste treatment plants and sewage works where high sulphate levels are to be expected. Both the repair mortars and fairing coats surpass the requirements for exposure class XA3 (highly corrosive) as defined in EN 206-1, and will give security and long life to any structure exposed to these demanding conditions.



Concrete Renovation Systems

Large Area Repairs

Sprayed Mortars

For repairs over large areas, nothing is as efficient as sprayed mortar.

Bridges, tunnels and sea defences are just some of the structures where this method of application can be particularly useful.

StoCretec dry spray mortars are renowned for their low dust formation and low rebound, essential properties that contribute to more comfortable working conditions and economical application.

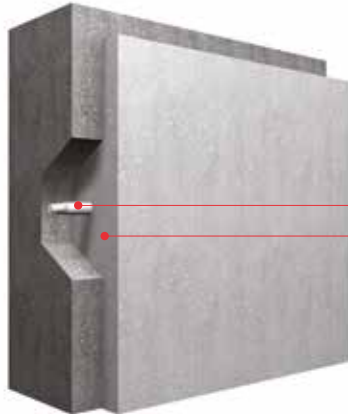
StoCretec TS 100 is a good sprayable mortar classed as R4 under EN 1504-3. It can be sprayed in multiple layers, 50mm at a time, to depths of 150mm and beyond. Once cured it has a fire classification of A1 according to EN 13501.

StoCretec TS 108 is an R4 class mortar particularly suited to permanent contact with fresh or sea water. Also with a fire classification of A1, StoCretec TS 108 can be applied in layers of 50mm up to 150mm and more.

Flowable Mortars

Used primarily for situations with congested reinforcement, StoCrete TV 304 and 308 flowable mortars offer an extremely low shrinkage, fast curing solution with exceptional strength. The products reach over 40N/mm² in just 24 hours, allowing early dismantling of formwork and enabling early reopening of the structure. Approved to EN 1504-3, these products are largely proven in repair of major civil structures such as bridges, and have also been used for balcony wall reconstruction and baseplate grouting.

StoConcrete Repair Dry System



- 1 StoCrete TK corrosion protection (if required)
- 2 StoCrete TS100 or TS108 dry spray mortar



StoCrete TS 108
for fast repairs over large areas



StoCrete TV 304/308
is ideal for pumping or pouring



StoCrete TV 308
flowable mortar has fast, early strength gain and is self-compacting

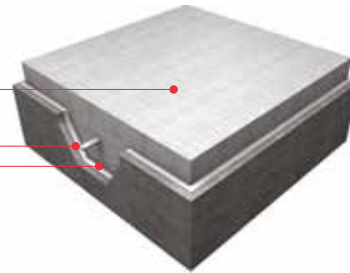
Concrete Renovation Systems

Floor repairs and screeds

StoCretec offer a variety of floor repair products to suit a wide variety of conditions and applications.

StoConcrete Screed Classic

- 1 StoCrete TG 104 or TG 108 screeding mortar
- 2 StoCrete TH200 corrosion protection and bonding bridge



Fast, simple and convenient, **StoCrete RM F** is a great solution for small floor repairs or adjustments with no bonding bridge required and a fast initial cure.

StoConcrete Screed Classic offers two general purpose repair materials with thickness ranges of 12-40mm (TG 104) or 20-80mm (TG 108). A secure bond to the substrate is assured by the use of StoCrete TH200 bonding bridge. Screed Classic is suitable for vehicle traffic and rated Class R4 to EN 1504-3.

StoConcrete Screed Prime is especially frost resistant and also has very high resistance to the penetration of chlorides. A permanent bond to the substrate and long life of the system is guaranteed by the use of StoCrete TH110 bonding bridge which can also be used as corrosion protection to reinforcement. The TG 114 or TG 118 materials have a very low water requirement, being mixed only with StoCryl EM110 Polymer Dispersion which ensures high resistance to cracking, improved adhesive strength and high flexural strength. Additionally the system is tested for compatibility with cathodic protection systems.

StoConcrete Screed Light is a lightweight screed system suited to areas where a lightweight screed is desirable such as balconies. Despite weighing just 1.4kg/m², StoCrete LE has a fire class of A1 to EN 13501-1, is flexible, with a low e-modulus and can be applied from 20-80mm thick.

StoConcrete Screed Resist provides an excellent solution for floor areas in chemically aggressive environments such as high sulphate conditions. Both the StoCrete TG 154 material and TH250 bonding bridge are tested and are suitable for XA3-type environments defined in EN 206.



StoCrete TG 104 and 108
- serious materials for serious repairs



High frost and chloride resistance with StoCrete TG 118



Quick and easy repairs with StoCrete RM F

Concrete Protection

Hydrophobic impregnation

StoCretec offer a range of Hydrophobic Impregnation materials for optimum protection of concrete structures from chlorides and carbonation, whilst maintaining the appearance of natural concrete. Hydrophobic treatments have been around for thousands of years – the Mayans made stone façades more durable by adding natural fats and oils to the surface. The technique has evolved to the products of today, providing one of the most effective measures against harmful substances dissolved in water, from entering the surface of the concrete.

StoCryl GW 100

A hydrophobic primer penetrating 1 – 1.5mm into the concrete and can be used either on its own, in areas of lower chloride load, such as bridge soffits, or as a primer for coating systems.

StoCryl HC 100

A hydrophobic cream for areas in the “mist zone” - areas that are exposed to high levels of chloride, such as bridge abutments. The cream consistency ensures long contact time with the concrete and aids absorption.

StoCryl HG 200

A deep penetrating hydrophobic treatment for areas in the “splash zone”. StoCryl HG 200 penetrates to at least 6mm, often much more, providing long-lasting, reliable protection to areas subject to prolonged and direct exposure to salts, e.g. central bridge supports or coastal structures subject to repeated splashing and drying cycles.



Garnsviken Bridge, one of many protected with HG 200 for over 25 years

Case Study – Sweden, a forward-looking approach

Having achieved early acceptance of hydrophobic treatment in Sweden, StoCryl HG 200 had been applied to numerous structures from the 1990's onwards. In order to determine the effectiveness and durability of the treatment, cores were taken from 28 bridge piers that had been treated between 2 and 15 years previously. All of the piers had been subjected to heavy chloride stress and the chloride content and depth of carbonation was determined prior to the application of the StoCryl HG 200. The laboratory examination of the cores revealed that at the time of examination the hydrophobic treatment with StoCryl HG 200 was still fully effective on all samples, having penetrated the structure to 10mm and more, preventing chloride penetration.

Concrete Protection

Long term durability and security

Exemplary protection against carbonation as well as providing decoration to exterior surfaces is provided by the StoCretec range of surface coatings. Alongside traditional products, highlights also include StoCryl V700 that reduces the chances of algae or mould growth or StoCryl RB with astounding crack-bridging abilities. StoCretec lead the market in Hydrophobic Impregnations that can give concrete structures lifelong protection against moisture and chloride ingress. All StoCretec coatings are compliant with EN 1504-2.

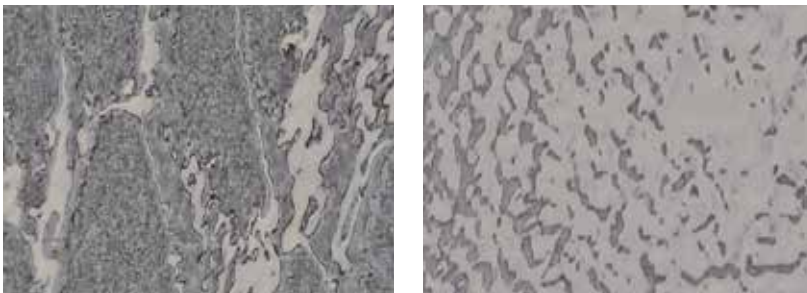
StoCryl coatings - stunning colour and carbonation protection

StoCryl V 100. A stalwart anti-carbonation coating with a mid-sheen finish, available in over 800 colours from the StoColor system.

StoCryl V 200. The sister product to V 100, with a matt finish and also available in over 800 colours from the StoColor system.

StoCryl V 700. An industry first – StoCryl V 700 uses StoColor Dryonic technology to form hydrophilic and hydrophobic channels on the surface. These channel water away extremely quickly, resulting in a fast drying surface that gives algae or fungi little chance to start growing. The best choice for long-standing, good appearances on concrete structures.

StoCryl V700 vs Normal Paint

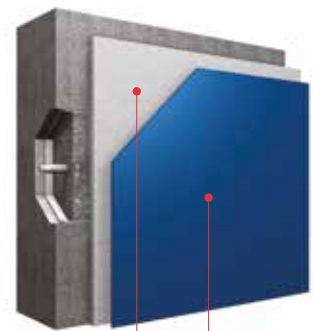


With over 800 colours available you're sure to find the one you need

Crack-bridging coatings and coating systems

StoCryl RB. With outstanding abilities to bridge both static and dynamic cracks, StoCryl RB is the best choice when the substrate is either already exhibiting cracks or could do so in the future. Moisture ingress is therefore prevented, in addition to the inherent carbonation prevention properties of the coating.

For further protection against the soiling of the surface, **StoCryl EF** can be added as a further coat. This stretches with StoCryl RB, providing better protection against the accumulation of dirt, and a crack-bridging coating system that looks good, long after the job is finished.



1 StoCryl RB

2 StoCryl EF

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