

Restofix – STP Limited Enhances Structures' Life With Repair And Rehabilitation Product Range

The deterioration of reinforced concrete structures is recognized as a major problem worldwide. Today, concrete repair is a major industry supporting the needs of virtually every concrete structure.

Each structure requires routine repair and maintenance, ranging from simple protective coatings to repair of spalling to strengthening of under-designed components. Apart from requiring regular maintenance, many structures require extensive Repair, Rehabilitation & Retrofitting.

Though concrete is quite strong mechanically, it is highly susceptible to deterioration and thus gets damaged & even fail ultimately, unless some measures are adopted to counter deterioration. Such deteriorated structures can be rehabilitated and retrofitted by using various types of modern repair materials and techniques.

STP Limited provides Restofix range of concrete repair materials manufactured to restore and repair damaged or sub-standard concrete by providing structural and non-structural repairs, in addition to sealing and bonding cracks through injections.



Understanding Deterioration And Corrosion

The durability advantage of cement concrete is a major reason why it is the world's most widely used construction material. But material quality, design and construction practices, and severe exposure conditions can cause concrete to deteriorate, which results in aesthetic, functional or structural problems.

Generally, concrete deterioration is gradual; and, depending on their service and environment, steel-reinforced concrete structures can stand for decades before



the onset of steel corrosion. Concrete can deteriorate for a variety of reasons, and concrete damage is often the result of a combination of factors.

Although concrete is porous in nature and the structure contains moisture and oxygen, due to its high alkalinity, the cover concrete surrounding the reinforcements, form a protective, passive oxide layer on the reinforcing steel that reduces the corrosion rate to a negligible level.

For reinforcing steel to corrode, the passive oxide layer on the steel must fail. If the concrete cover that protects the reinforcing steel is damaged and the bond between the concrete and steel



reinforcing bar is broken, the steel's passive layer will break down and active corrosion of the steel will start. There are two mechanisms, however, that will damage the passive layer on the steel reinforcement, even if the concrete cover is not damaged: chloride ions and carbonation. This makes the steel vulnerable to corrosion.

Steps For Concrete Repair And Maintenance

Before commencing any repair work, it is necessary to carry out thorough inspection and evaluation, identify the root cause of the deterioration and accordingly a repair methodology to be prepared and followed. An incomplete or incorrect evaluation may lead to decide on carrying out only surface repairs without addressing the root cause of deterioration. Eventually, the repair work will lead to failure and re-occurrence of the damages.

Accordingly, there are seven basic steps for concrete repair and maintenance:

- Determine the cause(s) of damage
- Evaluate the extent of damage
- Evaluate the need to repair
- Select the repair method and material

REPAIR, REHABILITATION AND RETROFITTING

- Prepare the existing concrete for repair
- Apply the repair method
- Cure the repair properly

In these steps, the choice of procedure, surface treatment and materials for concrete repair will depend on the existing degree of deterioration, the mechanism of deterioration, its causes and anticipated future service requirements.

STP Limited's RestoFix Products by Sequence and Segment			
Product Segment	Product Name	Description	Area of Application
Crack Injection	ShaliGrout IP	Expanding additive	For cement slurry injection grouting in voids
	ShaliGrout EI	Low viscous epoxy	For strengthening with epoxy injection in cracks and voids
	ShaliGrout PU	Low viscous polyurethane	For sealing of active leaking cracks in concrete
Corrosion Protection	ShaliRust Off	Chloride free, sulphate free rust remover	For rust removal from reinforcements
	ShaliPrime Zn	Epoxy resin-based zincrich corrosion inhibitor coat	Corrosion protection of reinforcement
Bonding Coat	ShaliCrete	Multifunctional Acrylic polymer	Improving bond strength of patch repair mortars and bonding of old to new concrete
	ShaliSBR Latex	Multifunctional SBR based polymer	
	ShaliBond Concrete	Epoxy based bonding adhesive for concrete	
Fibre reinforced Polymer Modified Mortar	ShaliFix FRM	Polymer Modified Fibre Reinforced Hand applied or sprayable Mortar	Repairs to irregular profiles, corners, edges; excellent for repairs to fire-damaged concrete
	ShaliFix FRM CI	Polymer Modified Fibre Reinforced Corrosion Inhibiting Mortar	
New Reinforcements	ShaliGrout Anchor	Polyester resin anchor grout	High strength corrosion resistance anchoring of reinforcement from 8 mm to 30 mm dia. in to concrete, rock, masonry or brick work
Micro-Concrete	ShaliFix MC	High strength, free flow micro-concrete	Repair of damaged concrete structures like columns/beams/slabs etc.
	ShaliFix MC CI	Repair Micro Concrete with corrosion inhibitor	
Crack Sealing	PlastiSeal	Thixotropic flexible crack sealer paste	To accommodate thermal or structural movement in small cracks in concrete, internal and external masonry wall etc.
	ShaliFix 3EP	Three component, non-shrink, epoxy based, putty for crack repair	
Pinhole Filler/ Levelling Mortar	PlastiSeal P	Cementitious surface Leveller, Pinhole & Crack Filler	Level undulation on un-plastered or plastered surfaces and wall prior to coating
Structural Strengthening System	ShaliWrap GF	Glass Fibre Fabric	FRP composite systems for structural strengthening
	ShaliWrap CF	Carbon Fibre Fabric	
	ShaliLam C	Carbon Fibre Laminates	
Protective Coatings	ShaliKote AC ShaliKote AC WB	Anti-Carbonation coating systems	Protection of Concrete Structures against ingress of harmful agents such that to enhance the life of the cover and the concrete structure in total
	ShaliPoxo CTE	Coal Tar Epoxy Coatings	
	ShaliPoxo	Epoxy Coating Range	
	ShaliProtek 2AC PU TC	Aliphatic Acrylic PU, UV Resistant Top Coat	
	ShaliUrethane PU TC 2K	Aliphatic PU, UV resistant top coat	
Impregnation Coatings	ShaliProtek CI SA	Dual phase surface applied corrosion inhibitor coating for reinforced concrete	
	ShaliKote SWP	Solvent Based Colourless Silane/Silicon WaterRepeller	
Corrosion Inhibiting Admixture	ShaliPlastrange	Waterproofing-cum-Corrosion Inhibitor for Reinforced Cement Concrete	Protects concrete from water ingress as well as saves the re-bars of reinforced concrete against chloride induced corrosion

Principles And Solutions For Sustainable Concrete Repair

The phases of repair projects follow a logical sequence, which is dominated by engineering aspects. Depending upon the sequence of repair for a concrete structure, the above Table shows the Product Segments, Product Details, Product Description and Area of Application.

The product details mentioned are to address the need for protection and repair of concrete and to prevent damages due to reinforcement corrosion, respectively.

STP's Restofix range of products for concrete rehabilitation includes ShaliFix polymer modified structural mortars and micro-concretes designed for replacing



the strength of concrete lost due to degradation. The ShaliFix range incorporates active corrosion inhibitors to ensure the integrity of steel reinforcement for many years after repair. Restofix also includes coatings for corrosion protection of steel reinforcements, anti-carbonation coatings for concrete to allow completion protection of structure of the project.

STP's Restofix range provides ShaliProtek coatings and protection systems and our ShaliWrap carbon and glass fibre and ShaliLam carbon laminates strengthening system.



STP Limited combines these materials to create engineering solutions that repair and extend a structure's useful life by preventing further damage and to return the structure to original or upgraded service requirements. ■

For further information,

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