MYK arment®

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ASSOCIATED

MYK arment®

Armed to deliver World-class Repair and Restoration Solutions

Excellence is a preference

At MYK Arment, we believe that the construction industry looks for solutions that are innovative, yet durable and reliable. Specifically, with the industry undergoing change due to rapidly evolving customer preferences and expectations, new age materials bring in a host of tangible efficiencies in terms of both cost and construction quality.

Precisely how our innovative range of products enable efficient use of construction material and builds structures with the essential traits of modernity and sustainability. Our products and solutions are the results of our evolved relationships with architects, contractors, specifiers, suppliers and their customers.

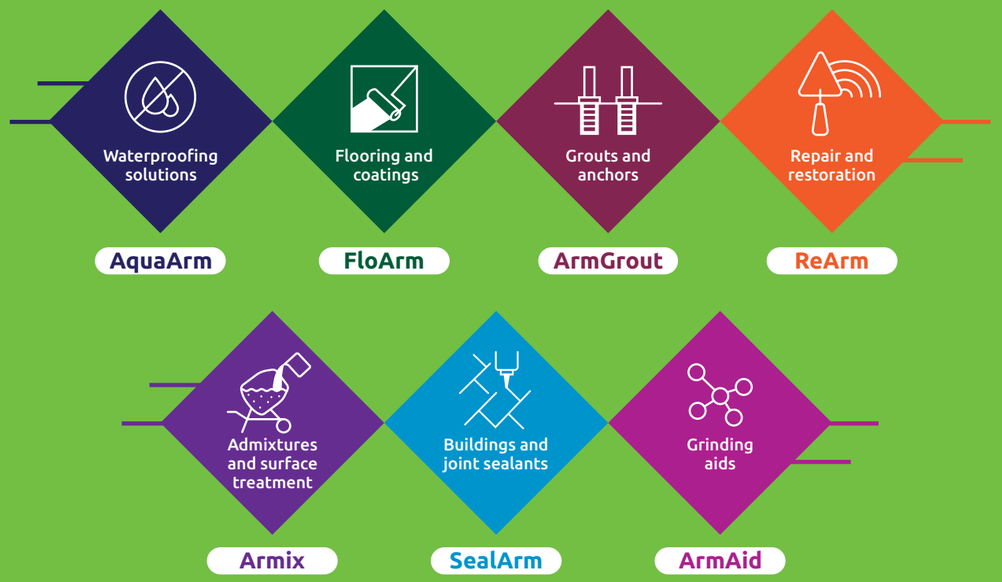
Every aspect of our product is engineered to usher in the ease of application across construction areas. Specifically, our products ensure:

- Improved material performance
- Greater reliability and durability
- Cost efficiency on time and effort
- Environmental sustainability

Reflecting the new age

The winds of modernity have ushered in new standards where design creates functional value, materials spawn innovation, smart space management and green benefits by way of sustainable architecture. Needless to say, budgets, longevity and aesthetics have become benchmarks for making decisions on construction material. There is a growing realization that costs of repair and afterthoughts are often expensive and many times demand structural changes.

MYK Arment's products carry unique brand names to reflect the essential traits that our stakeholders look for while choosing the right construction chemical.



Capabilities that spawn innovation

Efficiency and application expertise have been the guiding principles of the global construction chemical industry. For this, we are continuously investing in innovation and new product development and rolling out products that fit into the needs of the industry.

MYK Arment's products are backed by a strong line-up of service capabilities, which translate into better value for our stakeholders and brighter relationships for the future. Our product range includes admixtures, grouts and anchors, repair mortars, bonding agents, adhesives, flooring & coating, curing and sealing compounds, dry shake hardeners, joint fillers, sealants, densifiers waterproofing, repair and other products.

Manufactured under stringent quality controls by adhering to best global practices, we employ cutting edge technologies. MYK Arment's manufacturing units are strategically located across India to ensure efficient supply and logistics.

GERMAN Technology

CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2015

Indian Green MEMBER Building Council

ReArm

Repair and Restoration

Repair and Restoration

Structural integrity of buildings is a cardinal rule in the construction industry. Every concrete structure is designed and built to last a specific timeline. However, owing to a variety of factors, both internal and external, they deteriorate and lose the strength to withstand load and use. Internal factors are the uninformed choice of inferior construction material quality, while the external ones are the ambient conditions like environment, usage and neglect.

MYK Arment believes that concrete structures have to serve the intended time and its life can be prolonged without compromising on the quality it offers. However, repairing and restoring demand a proactive understanding of the areas under deterioration and its bearing on the overall structure's integrity. More so because there are several considerations that warrant repair and restoration and all have to be met sufficiently and effectively.

Why repair and restore?

- Enchance the service life of structure
- Restore structural Integrity
- Improve durability of structures
- Improve aesthetics
- Enhance structural properties for additional loads
- Protection from corrosion

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Common sights of concrete deterioration

Reinforced concrete structures are designed for strength and serviceability but undergo premature distress and damage during their service life. Many factors, external and internal, can be a cause and result in concrete deterioration which can be broadly classified as:

Mechanical

Overloading or movement of the structure itself results in cracking and gradual erosion of the concrete layers.

Chemical

Soil contains chlorides and sulphates which are aggressive chemicals. Over time, they weaken the cement's binding ability and the concrete structure.

Physical

Besides breakage due to external impact, water trapped in the capillaries of concrete freezes and causes expansion resulting in concrete loosening up. Other reasons are abrasion and wear and tear due to traffic.

Natural Calamities

Adverse weather conditions including floods, storms, earthquakes and other geological disturbances can weaken or even permanently damage concrete structures.

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Matrix of risk factors

A matrix of both internal and external factors contributes to the deterioration and damage of concrete structures. Timely action on repairs helps restore integrity and reset life of the structure.

Internal factors

- Design flaws
- Usage of inferior materials
- Poor construction practices
- Internal distress

External factors

- Effects of environment
- Physical cause due to temperatures & humidity
- Overloading of existing structures
- Measure and abuse of structures
- Carbonation Effect
- Corrosion

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Repairs begin with ReArm

A professional and a proactive approach towards understanding the functional performance and construction material used in the structure is critical to arrive at the right solutions. More so because deterioration of concrete structures is common but it can be effectively stopped from further spiraling into serious damage.

Specifically, MYK Arment's methodical approach to repair and restoration covers all visible and invisible areas of the structure.

Assessment and diagnosis

Right from the structure's inception to its current condition, our teams perform a comprehensive assessment. Several criteria are factored in like functionality, environment, contaminants, etc. Distress areas are diagnosed by way of visual inspection, sounding survey, chemical tests, etc.

Product selection

MYK Arment's native experience with the industry has helped in evolving a deep and solid understanding of structural distress and deterioration. Our advanced range of products for repair and restoration mean that right solution is applied, without compromising on quality.

Tools and techniques

Once our teams take stock of the areas that need repairs, an array of tools are selected to make surfaces ready. Our experts also map techniques so that the project can be accomplished within set goals and budgets.

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Application

Our teams impart live and hands-on training and technical support to workmen on how to handle and apply material to various surfaces. This also helps contractors to raise the skill levels and adapt to new demands of the industry.

Protection

Civil engineering infrastructure needs to be protected from environmental corrosion caused by chlorides, carbon-di-oxide, sulphates, alkalis, etc. In order to function throughout their designed service life, it is essential to protect the surface of steel and concrete from chemicals, corrosion and weather effects. Protective coatings help in safeguarding infrastructure, both during the new construction phase and post maintenance, with repair and rehabilitation.

Areas of application: MYK Arment's extensive range of advanced solutions for repair and restoration can be applied to all concrete structures like:

- Commercial and residential buildings
- Car parks
- Podiums
- Bridges
- Marine jetties
- Chemical and industrial plants

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Distressed column retrofitting

Reasons

- Improper placement of concrete or voids
- Leakage/Chemical
- Alkaline aggregate reaction

Repercussions

- Structure becomes unstable
- Structure may collapse causing collateral damage

MYK Arment's Recommended Repair System

- ArmGrout HF 66 • ReArm Bond AR 43 • FloArm Coat ZP
- ReArm Crete MC-M • ReArm SS CFRP • FloArm Coat AntiCarb

Advantages

- Excellent bonding strength between old and new surfaces
- Dimensionally stable
- Repair mortar attains good compressive flexural and tensile strength properties
- Eco-friendly
- Carbon fiber wrap strengthens the column
- Requires minimal curing

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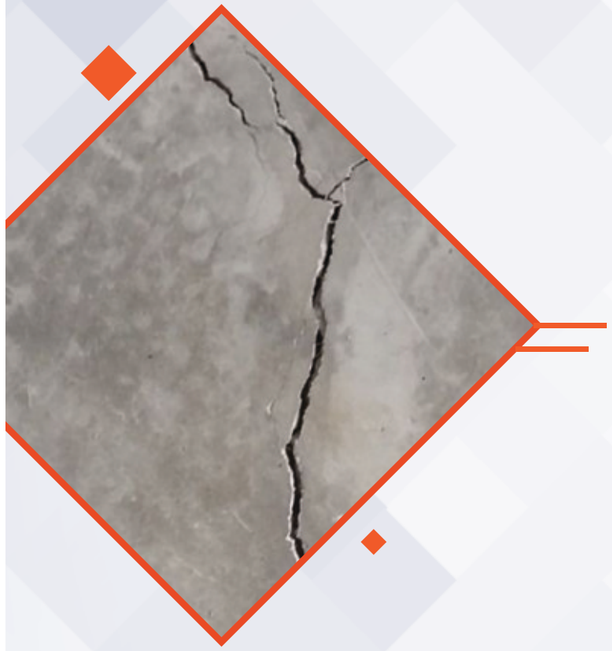
Repairing internal wall cracks



Reasons

- Poor workmanship
- Variation in temperature/thermal changes
- Initial shrinkage
- Impact of natural elements
- Poor maintenance

Repercussions

- Aesthetics
- May cause leakage

MYK Arment's Recomended Product

- ReArm KrackFill Paste

Advantages

- Excellent bonding strength
- Low water permeability
- Dimensional stable and flexible crack filling
- Eco-friendly and non-hazardous
- Requires minimal or no curing

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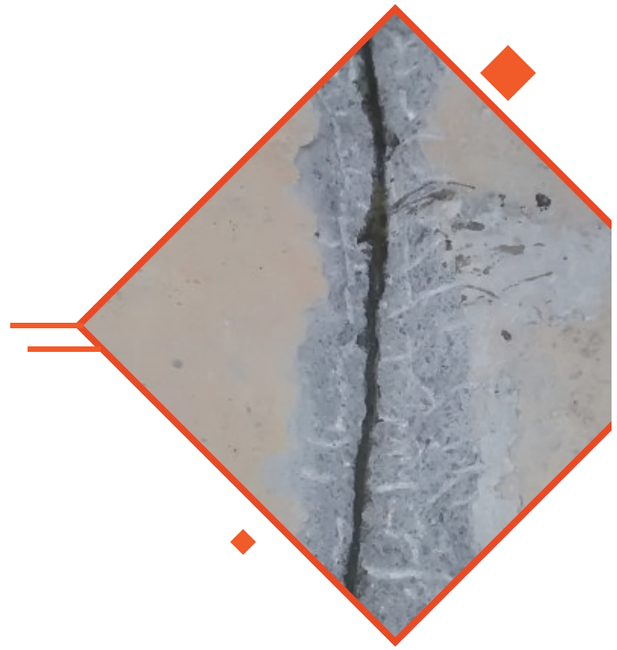
Cracks in concrete

Reasons

- Excess water and cement ratio
- Rapid drying
- Lack of control joints
- Change in mechanical loads
- Improper substrate preparation
- Improper curing
- Wrong position of steel (without cover blocks)
- Concreting on frozen ground
- Thermal expansion and contraction
- Poor supervision and material



Repercussions

- Penetration of water through cracks leading to leakages
- Impact of chemicals and gases dissolved in water leading to deterioration of steel and concrete
- Unstable structure

MYK Arment's Recommended Product

- ArmGrout Inject EP

Advantages

- Excellent bonding strength between old and new surfaces
- Corrections possible due to slow setting time
- Highly viscous material, penetrates deep into the concrete
- Eco-friendly and non-hazardous

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Honeycombing in concrete

Concrete honeycombing is a cosmetic condition that is found only in the exterior areas of concrete.

Reasons

- Mix not cohesive
- Incorrect mix design (less fines and more coarse allows coarse to consolidate)
- Congestion of steel
- High concrete free fall while pouring
- Foam work dripping or not watertight
- Poor workability (incorrect W/C ratio reduces workability)
- Excess vibration or improper compaction
- Oversize aggregate

Repercussions

- If honeycomb is left untreated, moisture penetrates and serious structural problems like corrosion could occur

MYK Arment's Recommended Repair System

- ReArm Bond AR 43
- ReArm Crete MC-M

Advantages

- Bond strength of the material is excellent (Bonding between old and new surface)
- Repair mortar attains good compressive strength at a very early age and is dimension stable (shrink free)
- The flow characteristic of the material is good
- Minimal or no curing requirement
- Low water permeability
- Eco-friendly and non-hazardous

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Spalling - Major chunk of the delaminated concrete cover

Reasons

- Improper placement of concrete or voids
- Corrosion of reinforced steel due to exposure to water through leakage
- Corrosion of reinforced steel due to exposure to chemicals
- Improper positioning of reinforced steel (concrete cover or cover block)
- Coarse concrete finish (smooth finish holds less water)
- Alkaline aggregate reaction

Repercussions

- Structure becomes unstable
- May collapse under its own weight
- Hazardous

MYK Arment's Recommended Repair System

- ArmGrout HF 66
- FloArm Coat ZP
- ReArm Bond SBR 45

Advantages

- Excellent bonding strength
- Repair mortar attains good compressive flexural and tensile strength properties
- Dimensionally stable
- Minimal or no water curing required
- Low water permeability
- Eco-friendly and non-hazardous

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Wall beam joint - Crack between RCC and masonry separation

Reasons

- Most widely and commonly seen separation cracks in modern RCC framed structures
- Improper construction practices
- Inadequate precautions during masonry construction
- Improper work sequence - Masonry work done post RCC
- Premature Loading

Repercussions

- Seepage
- Plaster deterioration

MYK Arment's Recommended Repair System

- ReArm Bond AR 43
- ReArm Crete RM

Advantages

- Excellent bonding strength
- Minimal or no water curing required
- Repair mortar attains good compressive flexural and tensile Strength properties
- Low water permeability
- Dimensionally stable
- Eco-friendly and non-hazardous

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Repairs & Restoration product selection guide

Nature of Problem	Application / Method	Substrate	Area of Application	MYK Arment Products
Active leakages/ Running water	Hand applied	Concrete	Horizontal, vertical & overhead	ReArm Fix 10S
Active leakages	Injection grouting	Concrete	Horizontal, vertical & overhead	ArmGrout Inject PU1 ArmGrout Inject EP
Blow holes / Surface imperfections	Trowel applied	Concrete	Vertical & horizontal	ReArm Fair Finish
Honeycombing (Restoration)	Trowel applied	Concrete	Horizontal, vertical & overhead	ReArm Crete RM
Reinstatement/ Rebuilding of concrete medium depth	Trowel applied	Large area concrete repairs	Vertical & overhead	ReArm Crete RM HS
Damaged columns beams and encasing of columns	Pourable by providing shuttering	Concrete	Vertical, horizontal & overhead with formwork	ReArm Crete MC
Strengthening & retrofitting for RCC and PSC structural members	Wrapping	Concrete	Column, beams & slabs	ReArm SS CFRP
Filling of potholes, voids, filling of joints trowel	Trowel applied	Concrete	Vertical & horizantal	FloArm ERM
Crack repair (Structural)	Injection / Pourable	Concrete	Vertical & horizontal	ArmGrout Inject EP-LV
Repairs for hairline crack	Trowel applied	Concrete	Vertical & horizontal	ReArm KrackFill Paste
Wide crack repairs	Trowel applied	Concrete	Vertical & horizontal	ReArm Crete TJM

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BS EN 1504 Guidelines for Repair and Protection of Reinforced Concrete Structures

In order to reinstate the strength and service life of the distressed structures to continue their functionality, there is a need for a holistic and professional approach to structural repairs, retrofitting and protection to be undertaken by the clients as stipulated in the International Standards for Structural Repairs and Protection **BS EN 1504.**

BS EN 1504 is a British and European standard which contains 10 parts and 11 principles for Repair and Protection of distressed RC Structures.

BS EN 1504 Standards approach to repairs and protection of distressed RC structures is through **Diagnosis of the root cause of the distress/damage,** in order to recommend the appropriate repair and protection principles, products, systems and methods to consultants, clients, product manufacturers and repair contractors/applicators to ensure that once the structure is repaired it will remain in a sound condition for the rest of its service life and hence a guide to structural repair consultants, material manufacturers and repair contractors/applicators.

MYK ARMENT repair and protective coating solutions comply with the specifications and guidelines of BS EN 1504 to impart high performance and durability to Civil Engineering Structures.

10 parts of Structural Repairs and Protection of BS EN 1504

- Part 1 — General scope and definitions of repair and protection of RC Structures
- Part 2 — Surface protective systems
- Part 3 — Structural and non-structural repair materials
- Part 4 — Structural bonding
- Part 4 — Concrete injection
- Part 6 — Anchoring of reinforcing steel bar
- Part 7 — Reinforcement corrosion protection
- Part 8 — Quality control and evaluation of conformity of repair and protection materials
- Part 9 — General principles for use of repair and protection products and systems
- Part 10 — Site application of repair and protection products and systems

Key parts of BS EN 1504

- BS EN 1504-8, sets out testing and compliance definitions for manufacturers
- BS EN 1504-9, sets out specification guidelines
- BS EN 1504-10, sets out material application guidelines for contractors.

Principle	BS EN 1504	Problem	BS 1504 reference
1	Protection against ingress	Concrete is porous material and is exposed to aggressive chemicals or contaminated water	**PI**
2	Moisture control	Excessive water penetration can cause damage to reinforced concrete	**MC**
3	Concrete resoration	Restoring the original concrete after spalling and delamination	**CR**
4	Structural strengthening	Increasing or restoring the structural load-bearing capacity after excessive loads or weakened structure	**SS**
5	Increasing physical strength	Increasing physical resistance to impact damage, abrasion and wear and tear	**PR**
6	Resistance to chemicals	Increasing resistance of concrete surface to chemical attack	**RC**
7	Preserving or restoring passivity	Restoring concrete to a highly alkaline condition to protect steel rebar	**RP**
8	Increasing resistivity	Increasing the resistivity of concrete to prevent rebar corrosion	**IR**
9	Cathodic control	Preventing corrosion of rebar reinforcement	**CC**
10	Cathodic protection	Reducing or preventing corrosion reinforcement	**CP**
11	Control of anodic areas	Creating conditions for the steel rebar which is not subject to corrosion	**CA**

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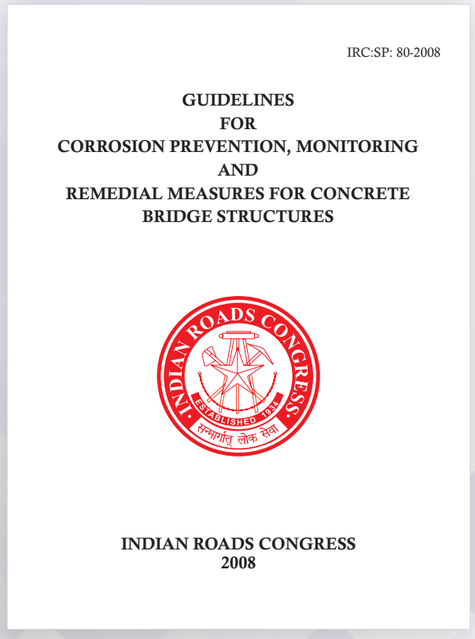
IRC SP 80:2008

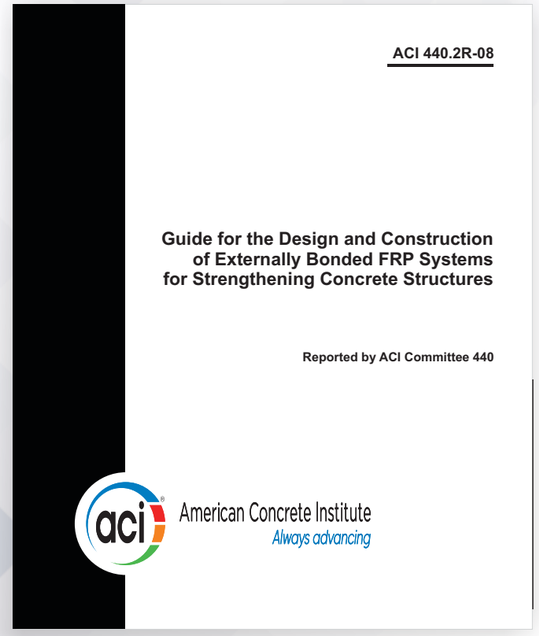
IRC SP 80:2008 is a code published by the Indian Roads Congress to give guidelines, recommendations and specifications for products and methods for maintenance, repairs, retrofitting and corrosion protection of bridge structures - Highways, Railways, Jetties and Metro Rail Viaducts.

MYK ARMENT's Repair and Restoration products/solutions and systems comply with the recommendations and specifications of IRC SP 80: 2008 ensuring high performance and durability to bridge structures both newly built and old that are distressed.


IRC:SP: 80-2008

GUIDELINES
FOR
CORROSION PREVENTION, MONITORING
AND
REMEDIAL MEASURES FOR CONCRETE
BRIDGE STRUCTURES

INDIAN ROADS CONGRESS
2008


ACI 440.2R-08

Guide for the Design and Construction of Externally Bonded FRP Systems for Strengthening Concrete Structures

Reported by ACI Committee 440

American Concrete Institute
Always advancing

ACI 440 2R

ACI 440 2R is a Code which provides design guidelines and material specifications for Carbon, Glass and Aramid Fibre Reinforced Polymeric (FRP) Composite Fabric Wraps and Precured Laminates for the application of Structural Strengthening/Retrofitting Technology for Reinforced Concrete Buildings, Industrial and Infrastructures,published by the American Concrete Institute.

MYKK ARMENT's REARM SS FRP Composite Solutions/Products/Systems conform to guidelines and specifications of ACI 440 2R Code thus ensuring high strength, performance and durability to the Civil Engineering Infrastructures which are Structurally Strengthened/Retrofitted.

Applications of ReArm SS FRP composite structural strengthening products

1. Column Confinement- Enhancement of Axial Load Carrying Capacity of RC Column with REARM SS CFRP & GFRP
2. Flexural Strengthening & Enhancement of Stiffness of RC Beams with REARM SS CFRP & GFRP
3. Flexural Strengthening and enhancement of Stiffness of RC Slab with REARM SS Laminates / Precured Carbon fibre plates
4. Wrapping of Column- Beam Joints with REARM SS CFRP – Seismic Retrofitting of RCC Structure