GALAXIE

Injection Resin Techniques

Basic

Galaxie Injection Resins

1. Introduction

Cracks in concrete caused by structural movement can lead to significant issues, especially when water infiltrates them. Water intrusion may result in freeze-thaw damage, corrosion of reinforcement steel, and overall structural weakening. Addressing these cracks promptly with appropriate grouting materials is crucial to maintaining structural integrity and preventing costly repairs.

2. Factors Influencing Grouting Material Selection

When selecting a grouting material, several factors must be considered:

- **Cause of the Crack** – Understanding whether the movement causing the crack has stopped or is ongoing.
- **Type of Crack Movement** – Some cracks "breathe," expanding and contracting with temperature and moisture fluctuations.
- **Strength and Flexibility Requirements** – Rigid materials may fail under movement, while flexible resins can accommodate shifting structures.

3. Types of Structural Cracks

3.1 Structural Movement

Movement occurs in all structures and typically affects joints and cracks. Factors influencing movement include:

- **Thermal Expansion** – Temperature fluctuations cause expansion and contraction.
- **Material Properties** – Different materials expand at different rates.
- **Distance Between Cracks** – Cracks farther apart experience more movement.

3.2 Settlement Cracks

These occur when the ground beneath a structure compress or shifts due to construction, groundwater changes, or increased structural loads. Settlement may lead to differential movement, resulting in cracks that allow water ingress.

3.3 Shrinkage Cracks

Common in concrete, shrinkage cracks result from moisture loss during curing. While minor shrinkage cracks may self-heal over time, excessive shrinkage can create persistent cracks that require sealing.

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3.4 Vibration-Induced Cracks
Vibration rarely affects crack movement significantly, except in cases of high-amplitude vibrations. Flexible or low-modulus grouts are typically used in such scenarios.

3.5 Relative Movement
Crack width changes under tension or compression. Narrow cracks undergo a higher percentage of movement than wider ones, making injection of very fine cracks more challenging.

4. Leak Types and Sealing Methods

4.1 Volume and Pressure Considerations

- **Small Leaks** – More difficult to seal as grouts struggle to penetrate fine water paths.
- **High-Volume Flows** – Controlled by diverting water through pipes before injection.
- **High-Pressure Leaks** – Require pre-relief drilling to reduce pressure before grouting.
- **Porous Surfaces** – Injection at close centres with low-viscosity resins is recommended.
- **Complex Cracks and Joints** – Trial and error may be needed when construction details are unknown.

5. Selecting the Right Injection Material

Most cracks experience movement over time due to environmental factors. Rigid repairs can cause stress concentration, leading to new cracks. Galaxie Injection Resins provide a balance between strength and flexibility, making them ideal for long-term crack repair.

6. Injection Process for Leaking Cracks

1. Surface Preparation – Clean the crack and remove debris.
2. Drilling Injection Holes – Drill at a 45° angle to intersect the crack.

3. Injector Placement – Secure injectors into drilled holes.
4. Flushing the Crack – Use water to remove loose debris and improve resin penetration.
5. Resin Injection – Inject GalaxiePU resin at controlled pressure.

6. Finishing – Remove injectors and seal any remaining openings.

7. Expansion Joint Repair

Galaxie Injection Resins are also suitable for repairing failed water stops in expansion joints. Unlike rigid materials, which inhibit movement, flexible resins allow expansion joints to function as designed.

Procedure:

1. **Surface Cleaning** – Remove old sealant and debris.
2. **Drilling and Injector Placement** – Ensure injection access without damaging water stops.
3. **Flushing and Pre-Sealing** – Control water leakage before injecting resin.
4. **Resin Injection** – Inject until pure resin appears at the next injector.
5. **Finishing** – Remove injectors and seal any remaining openings.

8. Safety Precautions

Read all health & safety guidelines before use.
Use protective gear, including gloves, masks, and ventilation.
Ensure proper training on handling isocyanate-based resins.
Keep emergency eyewash stations available.
Prohibit smoking and eating in application areas.

By following these best practices, Galaxie Injection Resins provide a reliable and long-term solution for structural crack repair and waterproofing.

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