



Guide to Concrete Repair

In repair and restoration work it is recommended to first take care of the cause before repairing the effect. Many times a condition survey is needed to determine the cause(s) and to plan the proper, most cost-effective approach to correct the problem.

Surface preparation is very important. The best of products with poor surface preparation is no better than the lesser product with the proper surface preparation.

What is Surface Preparation?

“The process whereby a method or combination of methods is used to remove deteriorated or contaminated concrete and roughen and clean a substrate to enhance bond of a repair material or protective coating.”

* In doing so, this will provide the desired cleanliness and profile of the substrate in order for the repair material or protective coating to achieve its full potential.

*ICRI Concrete Repair Terminology.

To restore Concrete, identify the **“Cause”** of the condition 1st...Then properly address the **“Effect”!**

Understanding the Cause

A site survey by an experienced professional is recommended for the purpose of identifying and defining areas of distress. For a lasting repair, it is critical to determine the cause of any problem to ensure that the appropriate products and procedures are specified.

Industry Recommendations and Specifications

ACI and ICRI provide industry specific reference documents providing in-depth description of various types of surface preps, substrate condition surveys, and selection & specifying

methods of surface preparation. ASTM provides test methods that repair products are often tested against.

- ACI 562, *Code Requirements for Assessment, Repair, and Rehabilitation of Existing Concrete Structures*
- ACI RAP Bulletins- “Field Guides” for various material applications
- ICRI 310.1, “Guide for Surface Preparation for the Repair of Deteriorated Concrete Resulting from Reinforcing Steel Corrosion”
- ICRI 310.2 Surface Preparation Standards
 - **CSP #** (Concrete Surface Profile) Designed to match equipment.
- ASTM C928, “Standard Specification for Packaged Dry Rapid-Hardening Cementitious Materials for Concrete Repairs”

Surface Preparation Methods

Waterblast	Sandblast
Scabber	Scarified
Milled	Grinder
Needle gun	Hammer & chisels
Shot blasting	

Procedures that should be followed

- “Sound-out” the surrounding area to define the edges of the repair
- Have a defined edge. Saw cut or use a grinding wheel to create a clean defined edge to which you will work the repair mortar.
 - Square or rectangular geometry recommended
- Provide a high-profile substrate for a good mechanical bond.
- Concrete substrate to be in a Saturated-Surface-Dry condition (SSD) so that the



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concrete will not absorb water from the repair mortar.

- Mixing methods: drill & paddle, mortar mixer, concrete mixer (when stone added), pump, by hand.
- When mixing less than a full bag always first mix the bag so that a representative sample is obtained.
- Add the powder to the water. Water requirements are the same if the material is used neat or if pea gravel extension is used.
- Application methods: by hand, form & pump, form & pour, dry packing, pneumatic (spraying), pneumatic (shotcrete).

General Use Repair Mortars:

Recrete™ 5 Minute & Recrete™ 20 Minute

- ASTM C928, Rapid set repair mortar
- Cost-effective, putty-consistency, repair mortar with no polymers or fibers
- Min. thickness 1/8", max. 2", neat
- Extend with clean washed stone for repairs > 2" per Tech Data Sheet
- Water substitution with Acrylic Bonding Agent J40 1:1, recommended for enhanced performance

Polyfast™ FS

- Rapid setting vertical, overhead and horizontal applications
- Polymer modified
- Min. thickness 1/4", max. 2", neat
- Extend with clean washed stone for repairs > 2" per Tech Data Sheet
- Putty-consistency, for easy shaping and finishing

Vertical/Overhead Repair Mortars:

Architectural Finish™

- Use for rubbing, smoothing, resurfacing repairing vertical surfaces
- Colored blended to a light gray
- Featheredge to 1/8" application depth

Perma Patch VO™

- ASTM C928, rapid set repair mortar
- Min. thickness 1/4", max. 2" neat
- Formulated for vertical / overhead applications
- Shrinkage compensated
- Can be sprayed or pumped through small volume pneumatic equipment
- Rapid strength gain
- Can be extended with aggregate for repairs > 2"

HD 25 VO

- ASTM C928, Rapid set repair mortar
- Designed for vertical and overhead applications
- Polymer modified; fiber enhanced
- Min. thickness 1/4", max. 2" neat
- More rapid initial strength gain than Polyfast FS

Civil / Structural VO

- Fiber reinforced; silica fume enhanced
- Formulated for use in spray applications using the wet process
- Can also be hand or trowel applied
- Contains a corrosion inhibitor
- Very high compressive strengths

Form & Pour Repair Mortars:

Civil / Structural FPX

- For form & pour or horizontal applications



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- Pre-extended with blended aggregate
- Contains a corrosion inhibitor
- Shrinkage compensated
- 1 inch to full-depth applications.
- Long working time

Perma Patch™ F/P

- Flowable/self-consolidating
- Up to 40-minute working time
- Ideal for horizontal or formed vertical/overhead applications
- High early strength

Horizontal Repair Mortars:

Thin Resurfacer

- Polymer modified
- Min. thickness 1/16", max. 1/2" and cannot be extended
- Substitute 1 qt. of water with J-40 for enhanced performance

Special Patch

- Polymer-modified, cementitious, two component repair mortar
- Shrinkage compensated & High early strength
- Trowel-able consistency
- Rapid-hardening mortar that accepts foot traffic in 1-2 hours
- Good resistance to freeze-thaw and impact
- Excellent abrasion resistance to heavy loads and traffic

HD 50

- ASTM C928, Rapid set repair mortar
- Pourable consistency
- Polymer modified; fiber reinforced
- Min. thickness 1/2", max. 2", neat

- Extend with clean washed stone for repairs > 2" per Tech Data Sheet

DOT Rapid Repair

- ASTM C928, Rapid set repair mortar
- Available pre-extended with aggregate
- Pourable consistency
- Polymer modified with Integral corrosion inhibitor
- Min. thickness 1/2", max. 2", neat
- Extend with clean washed stone for repairs > 2" per Tech Data Sheet

Pave Patch 3000

- ASTM C928, Rapid set repair mortar
- Pourable consistency
- Min. thickness 1/2", max. 2", neat
- Extend with clean washed stone for repairs > 2" per Tech Data Sheet
- Capable of being extended up to 60% (40# stone) per bag
- Resists freeze-thaw cycles to extend the life of the patch

Resinous Based Repair Mortars

ProPatch VO

- Non-sag, epoxy repair mortar
- 2 component epoxy system
- Available in cartridge or bulk containers
- UL Certified – Drinking Water System Components to NSF/ANSI 61
- Low odor

Sure Patch™

- 100% solids 3-component low modulus repair material
- Trowel-able
- Rapid strength gain
- Moisture insensitive



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Rapid Resin Repair

- 100% solids 3-component low modulus repair material
- Chemically resistant
- Cures from -20°F to 130°F
- Low odor

Specialty Repairs:

Anchor All

- Non-shrink
- Pourable
- Fast setting
- Ideal for posts and dowels

Waterstop

- Rapid setting hydraulic cement
- For plugging & stopping water or fluid leaks in concrete or CMU
- Initial set 2½ min., final set 3½ min.
- Non-corrosive, non-rusting