



SYSTEM 44-SERIES

STRUCTURAL CONCRETE REPAIR MORTARS

DESCRIPTION:

Edison *SYSTEM 44-Series* patching compounds are one-component, cement-based mortars designed for effective and economical repairs to all types of concrete structures. The series includes a wide range of formulations, each engineered for maximum performance and workability under a particular set of service and application conditions.

RECOMMENDED USES:

- Deck Patching
- Vertical Surface Repairs
- Negative Angle (Overhead) Repairs
- Trowel Applications
- Pour or Pump Applications
- Repairs to Beams and Columns
- Walkway Repairs
- Piers and Dams
- Water Tanks and Pools
- Industrial Floor Repairs
- Parking Decks and Ramps

SYSTEM ADVANTAGES:

System 44-Series pre-packaged repair mortars offer consistent proportioning and reliable performance at moderate cost. Formulations take maximum advantage of the most advanced available performance-enhancing cement admixtures in the industry. The result is a series of user-friendly repair compounds offering exceptional workability, durability and productivity.

SYSTEM SELECTION:

1. SET SPEED: Start with an assessment of the desired setting time. Will repair areas have to be back in service minutes after application, or would longer working time be advantageous? With three standard set speeds to choose from, there is an optimum *44-Series* system for each situation:

SYSTEM 44: "Regular" setting material offers the right combination of working time and strength development for most applications. Allows time for fine finishing, and facilitates work in hot weather, when other products may set too quickly.

SYSTEM 44-FS: "Fast Setting" formulas reduce downtime and permit work at lower temperatures.

SYSTEM 44-FS+: "Fast Set Plus" formulas allow repairs to areas that cannot be closed to traffic for more than a few minutes. FS+ can also be used to achieve durable repairs at sub-freezing temperatures, when other compounds are unusable.

2. GRADE: Once set speed has been selected, the next decision revolves around where the product will be used and how it will be applied. Select the grade of **SYSTEM 44, SYSTEM 44-FS or SYSTEM 44-FS+** which closely meets the requirements of your repair situation.

Standard (Horizontal Surface) Grade: Repair mortars for horizontal surfaces provide good leveling without compromising strength. At the same time, mixes should not tend to separate or settle, allowing the use of mechanical pumping equipment for large-scale applications.

Vertical/Overhead ("V/O") Grade: Mortars for use on vertical and overhead repair areas can be built up without sagging or dropping out of the repair cavity.

3. OPTIONS: In addition to the standard formulations based on speed and application, the *44-Series* also includes several options which allow you to further tailor the repair material to the requirements of the situation.

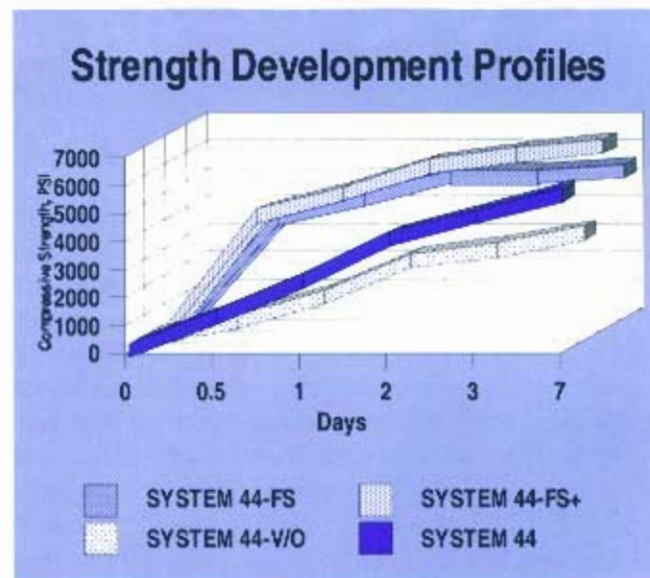
A. NON-POLYMER ("NP"): While all *44-Series* standard formulations are polymer-modified using the highest quality admixtures, some situations - such as continuous underwater exposures and applications to "can't dry" surfaces - are better addressed by unmodified mixes or by mixes modified with a marine grade latex modifier such as *Restoration Latex RL-3*. Still others may have a preference for liquid modifiers, such as *SYSTEM 42* acrylic modifier, which facilitates efficient hand-mixing of small mortar batches, or *Restoration Latex RL-1*, which provides superior control of appearance with mortars which will be pigmented. Liquid admixtures can also be used with non-polymer grades of *44-Series* mortars where locally available water is of poor quality, to eliminate any need for mixing water. If no polymer will be used, provisions for wet curing should be anticipated, and alternative adhesion-promoting techniques - such as proper slurry coating - should be employed.

B. FIBER REINFORCED ("FR"): Fiber addition to concrete and mortar has become a well-accepted alternative to secondary reinforcement. Fibers also reduce shrinkage and plastic cracking, increase tensile strength and may aid in dispersing impact and vibrational forces. The short (approx. 1/2") fibers available in *44-Series* products are alkali-resistant polymers which will not corrode or change in volume. The level of addition and length of fibers used have been selected to provide the optimum enhancement without compromising workability. All *44-FS+* products include fiber reinforcement in the standard formulations.

C. SILICA FUME ("SF"): The addition of microsilica to Portland cement mixes is credited with providing reduced permeability to moisture and salt, and consequently, improved corrosion protection for steel reinforcement. Microsilica is offered on *SYSTEM 44* (Normal Set Speed) products, which have been balanced to

accommodate the effects of microsilica on water demand and workability.

PRODUCT CHARACTERISTICS:



Composition: Products are polymer-modified cement-based mortars, free of chlorides, metallic additives, water repellents and other potentially deleterious admixtures. Silica aggregates used in *SYSTEM 44-Series* products have been washed and screened to remove nearly all toxic crystalline silica.

Adhesion: Products develop high direct tensile bond strength (>125 psi) and adhere to concrete, masonry, steel, wood and polystyrene foam. *SYSTEM 44* is not recommended on wood.

Weathering: *44-Series* products are UV-Stable, non-yellowing, resistant to wet/dry and freeze/thaw exposures and are intended for both outdoor and indoor use.

Minimum Use Temperatures:

SYSTEM 44	45°F	(6°C)
SYSTEM 44-FS	40°F	(4°C)
SYSTEM 44-FS+	25°F	(-3°C)

TYPICAL SET TIMES (72°F)

Product	Initial Set Time (Minutes)
<i>SYSTEM 44</i>	60 - 70
<i>SYSTEM 44-FS</i>	45 - 60
<i>SYSTEM 44-V/O</i>	60 - 90
<i>SYSTEM 44-FS+</i>	20 - 30

TYPICAL PROPERTIES

System 44, 28-Day Cure, 72°F

Compressive Strength	5600 psi
Modulus of Elasticity	1.1 x 10 ⁶
Tensile Strength	>500 psi
Direct Tensile Bond	>125 psi
Drying Shrinkage	Low (<0.05%)

APPLICATION:

1. Surface Preparation

Proper surface preparation is essential to the success of any concrete repair program. The extent to which existing materials must be removed and replaced will be influenced by a variety of existing conditions and anticipated exposure considerations. Except for minor repairs, structural restoration is best performed under the direction of a qualified professional. As a reference resource, we recommend the ICRI publication #03730, "Surface Preparation Guidelines for the Repair of Deteriorated Concrete Resulting From Reinforcing Steel Oxidation".

As a general guide, surface preparation must result in the removal of all unsound concrete, and any coatings, oil, dirt, paint, curing compounds, corrosive chemicals or any other material which may hinder adhesion or performance of repair mortars. A clean, hard, rough surface should be provided. Shape and depth of the repair should also be considered. Although *44-Series* repair compounds are designed to adhere and gain strength even in thin sections, many types of structural repairs are better accomplished when edges are saw cut. Following removal of concrete from the repair area,

abrasive blasting or high pressure water blasting should be used to remove dust, concrete slurry or loose aggregates. Vacuuming does not effectively remove fine dust from surface pores.

2. Priming

Patching compounds should not be applied to dry surfaces. As a minimum measure, surfaces should be dampened with clean water for at least 20 minutes before patching. Any excess standing water should be removed before repair compound is placed. Priming with a slurry of *SYSTEM 44-Series* mortar mixed with latex bonding agent such as *SYSTEM 42* is preferable to water dampening. Slurry coat should not be allowed to set for more than 4 hours before patch application. An alternative for priming is the use of *FLEXI-BOND 540* epoxy bonding agent. This material can be used to protect steel reinforcement, consolidate porous substrates and create a waterproof barrier between the slab and repair mortar while providing exceptional adhesion. Patching compound may be placed any time before *FLEXI-BOND 540* cures to a tack-free film.

3. Application

While application procedures can vary as widely as the concrete repair situations being addressed, certain basic guidelines are important to follow in the use of *44-Series* repair mortars:

a. **Keep water addition levels low.** Generally, the lower the water-cement ratio, the lower the permeability and the higher the strength of the completed repair. Use the minimum amount of water which will produce a workable, plastic consistency. **Horizontal** grades *44 and 44-FS* should use less than 2/3 gallon water per 50-pound bag. **FS+** and **Vertical** grades are designed for higher water use levels, typically at about 1 gallon per 50 lb. bag. **V/O** grade should be mixed to a damp crumbly consistency which compacts when pressed and "slicks out" when troweled.

b. **Do not retemper or overwork.** Maximum workability is obtained shortly after mixing. Do not add more water once material starts to set. Finish surfaces as quickly as possible after placement. Dampening of tools or light misting of plastic mortar surfaces is recommended to aid in finishing, when moderation is exercised. Slight surface dampening is also preferable to making "wetter" mixes.

c. **Avoid rapid drying, but dry cure.** Polymer modified cement mixes require a minimum period of moisture in order to gain strength. When working under hot, dry or windy conditions, surfaces may require misting or plastic film protection to avoid too-rapid drying. This is particularly important when large or deep patches are exposed to direct sun. A minimum of 2 hours before drying is required for thin repairs, while sections over 1" deep will benefit from up to 24 hours moist curing. Beyond this relatively short moist curing period, it is essential that the repair compound be allowed to dry out. Continuous moist cure will prevent the latex admixture from forming a proper film, resulting in reduced mechanical strengths and adhesion. After initial set, however, intermittent wet exposures, such as periods of rain or occasional spillage, do not compromise properties. Patches which will be submerged should utilize *NP Non-Polymer* grade, mixed with *Restoration Latex RL-3*, Marine/Immersion grade polymer admixture. Dry cure for a minimum of 5 - 7 days before submersion.

CAUTION!: Dry-curing guidelines do **not** apply to **non-polymer 44-Series** products, which will benefit from extended **wet** curing. *SYSTEM 44-NP* should be wet cured for up to 7 days. *SYSTEM 44-FS-NP* reaches full cure in 24 - 48 hours. *SYSTEM 44-FS+ NP* can be wet cured for 12 - 24 hours.

d. **Temperature and humidity affect set times and curing.** Be aware of weather changes and their effects on pot life, drying time and strength development. Particular attention must be given when working at low temperatures or when rain is threatening. If materials are not allowed sufficient cure time to reach strengths at which they can withstand rain or freezing, damage may result. Polymer-modified patches must be through-dry before freezing.



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3. STORAGE & HANDLING:

Observe all safety and handling guidelines as detailed in the Material Safety Data Sheets supplied with this product.

Keep dry and off the floor or ground. Store at 45 to 85°F for longest shelf life. Do not expose bags to rain or high humidity.

Avoid skin and eye contact. Cement can cause burns and injury. Wash exposed skin immediately with mild soap and water. In case of eye contact, flush with clean water for at least 15 minutes and consult physician.

Avoid breathing dust. Sand may contain residual free silica which may cause occupational lung disease. Wear NIOSH-approved dust filters rated for silica exposure when handling dry materials. Products may contain Portland cement and lime. Avoid skin and eye exposure as burns may result.

FOR COMMERCIAL AND INDUSTRIAL USE

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