

**R3***High Performance, Rapid Setting Repair Mortar***DESCRIPTION**

**R3** is a high performance, rapid setting, rapid hardening, high-early strength concrete patching material designed for horizontal, vertical and overhead applications. **R3** is a blend of carefully selected portland cements, selected aggregates and proprietary admixtures. **R3** provides outstanding resistance to the damaging effects of freeze/thaw cycles and deicing solutions. **R3** is easy to use, non-sag and creamy in texture. Additionally **R3** can be shaped-to-form once sufficient set is achieved. **R3** has been specifically formulated to provide excellent workability while demonstrating similar physical characteristics to the concrete substrate. This allows for the even distribution of stresses placed on the repair by dynamic loading and freeze/thaw conditions.

**USES**

**R3** is ideal for a wide variety of concrete surface repairs:

- Precast concrete products
- Tilt-up panels
- Curbs and steps
- Foundations
- Columns
- Sidewalks
- Bridges

**BENEFITS**

- Resistant: Withstands freeze/thaw damage and de-icer scaling
- Versatile: Horizontal, vertical and overhead applications
- Performance: Excellent flexural, bond and compressive strengths
- Time: High early strength, rapid setting and hardening
- Ease of Use: Excellent workability with non-sag properties
- Consistent: Strict Quality Control testing and standards

**STANDARDS**

**R3** meets and exceeds the requirements of ASTM C928 R3.

**SURFACE PREPARATION**

All surfaces in contact with **R3** shall be free of dirt, oil, grease, laitance and other contaminants that may act as bondbreakers. All unsound concrete should be removed to ensure a good bond. Smooth, dense surfaces need to be mechanically abraded to provide necessary bonding requirements. Mechanically prepare the substrate to a minimum CSP 5 following ICRI Guideline 310.2R to allow proper bonding. ACI recommends that the area to be patched should be saturated for 24 hours before placement. Remove any standing water. Surface should be saturated surface dry (SSD). For best results, scrub some of the mixed components into the prepared surface. Do not allow scrub coat to fully dry before placement. Always apply a test patch. Maintain contact areas between 40°F (4°C) and 90°F (32°C) prior to repair and during initial curing period.

**MIXING**

For best results, use a mechanical mixer with rotating blades or use a heavy duty 1/2" (15 mm) (or larger) low-speed, corded drill and mixing paddle #6 per ICRI Technical Guideline 320.5. Pre-wet mixer and empty excess water. Place 3.75 quarts of cool, clean potable water per 50 lb (22.7 kg) bag in mixer, then add dry material. Mix on low RPM for a total of 3 to 5 minutes to achieve desired consistency. Mix only enough material that can be placed within working time. Do not blend excess water as this will cause bleeding and segregation. Do not use any other admixtures or additives.

**PLACING**

**R3** should be placed upon completion of mixing. Place material consistently, avoiding any air entrapment. Trowel material onto the surface to be repaired, ensuring all pores and voids are filled. Force material against edge of repair, working away from center. After leveling, the patch can be troweled, brushed or broomed to the desired finish. When material has reached the proper set, it can be shaved, shaped or molded with a steel trowel. Multiple lifts can be applied. Each lift should be between 1/8" and 2" thick. Profile or roughen each lift to ensure a good bond.

**FINISHING AND CURING**

Follow standard ACI curing practices. Exposed surfaces should be cured with a membrane forming compound such as **US SPEC Maxcure Resin Clear**, **US SPEC Hydrasheen** or **US SPEC Hydrasheen 30%**.

**STORAGE**

Normal cement storage and handling practices should be observed. Store material in an interior, cool, dry place. Shelf life is one year in original, unopened container.

**LIMITATIONS**

In addition to limitations already mentioned, please note the following. Do not apply when the surface or ambient temperature is below 40°F (4°C) or expected to fall below 40°F (4°C) within 48 hours. Do not apply over surfaces that are frozen or contain frost. Do not apply over any active faults or cracks in the substrate without addressing any movement that may occur. Allow concrete to fully cure for 28 days before use of this product. Setting time will speed up in hot weather and slow in cold weather. For hot and cold weather applications, contact your US SPEC manufacturer's representative.

**Packaging: 50 lb (22.7 kg) bag, 63 bags per pallet**

**R3***High Performance, Rapid Setting Repair Mortar***PHYSICAL PROPERTIES**

All Physical Property testing performed in laboratory conditions of  $73.5 \pm 3.5^{\circ}\text{F}$  ( $23 \pm 2^{\circ}\text{C}$ ) and a relative humidity no less than 50% unless otherwise determined by the test method or specification. All results represent R3 with 3.75 quarts water unless listed otherwise. Tests are conducted under standardized conditions for comparative purposes, and results may not be representative of performance under field conditions.

Property and Test Method	Results			
<b>Compressive Strength</b> ASTM C109	<b>3 Hours</b>	<b>1 Day</b>	<b>7 Days</b>	<b>28 Days</b>
	3,500 psi (24.13 MPa)	5,000 psi (34.47 MPa)	6,000 psi (41.36 MPa)	7,000 psi (48.26 MPa)
<b>Rate of Set</b> ASTM C266	<b>Working Time</b>	<b>Initial</b>	<b>Final</b>	
	:20	:25	:35	
<b>Flexural Strength</b> ASTM C78	<b>7 Days</b>		<b>28 Days</b>	
	1,000 psi (6.89 MPa)		1,500 psi (10.34 MPa)	
<b>Length Change</b> ASTM C157	<b>28 Days Air</b>		<b>28 Days Water</b>	
	(-)0.06%		(+)0.01%	
<b>Freeze/Thaw Resistance</b> ASTM C666	<b>F/T Cycles</b>		<b>Durability</b>	
	300		107%	
<b>Scaling Resistance</b> ASTM C672	<b>Age</b>	<b>Scaled Material</b>	<b>Visual Rating</b>	
	25 Cycles	.004 kg/m <sup>2</sup>	0	
<b>Bond Strength</b> ASTM C882	<b>1 Day</b>		<b>7 Days</b>	
	2,000 psi (13.78 MPa)		2,500 psi (17.23 MPa)	
<b>Modulus of Elasticity</b> CRD C469	3.29 x 10 <sup>6</sup> @ 28 days (22.69 GPa)			
<b>Coefficient of Thermal Expansion</b> CRD C39	4.7 x 10 <sup>-6</sup> in/in <sup>o</sup> F (8.46 x 10 <sup>-6</sup> cm/cm <sup>o</sup> C)			

**DANGER**

This product contains Crystalline Silica (CAS# 14808-60-7) and Portland Cement (CAS# 65997-15-1). Harmful if swallowed. Causes skin irritation. Causes serious eye damage. May cause an allergic skin reaction. May cause cancer. May cause respiratory irritation. Causes damage to organs through prolonged or repeated exposure. Do not eat, drink or smoke when using this product. Wash hands thoroughly after handling. Contaminated work clothing must not be allowed out of the workplace. Do not handle until all safety precautions have been read and understood. Wear protective gloves/protective clothing/eye protection/face protection. Use only outdoors or in a well-ventilated area. Do not breathe dust.

**WARNING:** Cancer and Reproductive Harm -
[www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)
**FIRST AID**

If swallowed: Immediately call a poison center/doctor. Rinse mouth. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center/doctor. If on skin: Wash with plenty of water. Take off contaminated clothing and wash it before reuse. If skin irritation or rash occurs: Get medical advice/attention. If inhaled: Remove person to fresh air and keep comfortable for breathing. Call a poison center/doctor if you feel unwell.

**MANUFACTURER/TECHNICAL SERVICE**

Contact your US SPEC manufacturer's representative for the most current product information. Always read and follow the warnings and instructions on the most current technical data sheets, available online at [www.usspec.com](http://www.usspec.com).

US MIX Co.  
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Tel: 303.778.7227 Fax: 303.722.8426  
Web Site: [www.usspec.com](http://www.usspec.com)

**NOTICE OF LIMITED WARRANTY** US MIX Co. (manufacturer) warrants to buyer that this product at the time and place of shipment is of good quality and conforms to the manufacturer's specifications in force on the date of manufacture when used in accordance with the instructions hereon. Manufacturer cannot warrant or guarantee any particular method of use, application or performance of the product under any particular condition. This limited warranty cannot be extended or amended by manufacturer's sales people, distributors or representatives or by any sales information, specifications of anyone other than the manufacturer. Liability under this warranty is expressly limited to refund of the purchase price. See product packaging for complete limitation of warranties and liability.

**Yield: 50 lbs (22.7 kg) will fill approximately 0.43 ft<sup>3</sup> when 3.75 quarts mixing water is used.**