



Vertical, Overhead & Precast  
REPAIR MORTAR



Updated 7.7.11

## 1 General Characteristics

**Pavement VR™** is a cementitious, rapid setting, *one step* vertical and overhead structural repair mortar with parging mortar consistency. It is a single component powder that is water activated. **Pavement VR™** has 15 to 20 minutes of working time **plus an additional 10 to 15 minutes to shape and shave the repair to match the existing contours of the host concrete.** **Pavement VR™** will exceed **2,500 psi in 3 hours from final set** and 6,000 psi at 28 days. **Pavement VR™ can be applied in a single lifts from 1/16" to over 4 inches without bonding agents or special application techniques and can be easily sculpted and shaved to match contours of host concrete.** **Pavement VR™** can be applied in ambient temperature ranges from 40 to 120 degrees Fahrenheit and **can be re-animated repeatedly to a gel state prior to final set without additional water for reduced material waste and ease of use.**

**RECOMMENDED USES:** **Pavement VR™** has been designed specifically for use in vertical and overhead applications such as spall repair and impact damage on beams, columns, pile and pile caps, tendon grouting, pressure bearing pre-cast pipe, curbs, steps, pre-stressed panels, tunnels, sewers, loading docks, silos, retaining walls, culverts, catch basins, decorative moldings, parapet walls, septic tanks, cold storage vaults and other pre-cast product repair applications.

## 2 Additional Physical Properties

### UNIT WEIGHT (NEAT)

115 lb/ft<sup>3</sup> (1842 kg/m<sup>3</sup>)

### SETTING TIME

Set Times at 72°F/22°C at 1" (2.54 cm) material depth

Initial set: 15 - 20 minutes

Final set: 25 - 35 minutes

### VOLUME YIELD

0.14ft<sup>3</sup> (0.004 m<sup>3</sup>) per 17 lb (7.7 kg) 2 gallon unit

0.43ft<sup>3</sup> (0.012 m<sup>3</sup>) per 51 lb (23 kg) 5 gallon unit

### COVERAGE (Approximate / 2 gallon bucket)

1/16" (1.5mm) 26.9 ft<sup>2</sup>

1/8" (3.0 mm) 13.4 ft<sup>2</sup>

1/4" (6.0 mm) 6.7 ft<sup>2</sup>

1/2" (12.0 mm) 3.7 ft<sup>2</sup>

3/4" (19 mm) 2.2 ft<sup>2</sup>

## 3 Specifications

Results provided by licensed engineering test laboratory and represent typical results from production materials. Actual results may vary from third party testing results; however, CERATECH's materials meet and/or exceed established internal quality control standards, (available upon request). All samples were air cured.

Property	Results 2" cubes	Test Method
<b>Compressive Strengths, psi (MPa)</b>		
3 hours	2516 (17.4)	ASTM C 109
1 day - 24 hours	3136 (21.6)	ASTM C 109
7 days	4226 (29.1)	ASTM C 109
28 days	7606 (52.5)	ASTM C 109
<b>Flexural Strength, psi (MPa)</b>		
7 days	665 (4.6)	ASTM C 78
28 days	685 (4.7)	ASTM C 78
<b>Splitting Tensile Strength, psi (MPa)</b>		
28 days	380 (2.6)	ASTM C 496
<b>Direct Tension Strength, psi (MPa)</b>		
7 days	319 (2.2)	ASTM C 496
28 days	TBD	ASTM C 496
<b>Bond Strength, psi (MPa)</b>		
1 day - 24 hours	1590 (11.0)	ASTM C 882
7 days	1610 (11.0)	ASTM C 882
<b>Scaling Resistance, lbs/ft<sup>2</sup> (kg/m<sup>2</sup>)</b>		
25 cycles	0	ASTM C 672
<b>Modulus of Elasticity, msi (GPa)</b>		
28 days	3.17 (21.8)	ASTM C 469
<b>Coefficient of Thermal Expansion, in/in/°F</b>		
28 days	2.01	AASHTO TP 60
<b>Length Change, % of total length</b>		
28 days soak / 28 days dry	-0.001 / 0.001	ASTM C 157

TBD - To be determined

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## 4 Site Preparation

Surfaces should be prepared in accordance with ICRI 03730, "Guide for Surface Preparation for the Repair of Deteriorated Concrete Resulting from Reinforcing Steel Corrosion." and / or ACI 546R-96 "Concrete Repair Guide". Concrete surfaces should be prepared by appropriate mechanical methods to obtain an exposed aggregate surface with a minimum surface profile of +/- 1/16" (1.5 mm) in accordance with ICRI 03732. Pre-existing coatings or surface treatments should be completely removed. Dry, clean, stable surfaces are required. Remove all standing water. Reinforcing steel should have no loose scale.

## 5 Mixing Instructions

### Standard NEAT Procedures (Bucket Mixing with Drill & Paddle)

- Loosen material by tumbling bucket & dry mixing *before* adding water.
- To ensure product performance, **DO NOT divide or separate individual units into smaller portions. MIX ENTIRE CONTENTS AT ONE TIME.**
- A drill (6 amp minimum) with a mixer blade turning at least 500 to 800 rpm is required. Drills with speeds greater than 800 RPMs may entrain air in the mix.
- **DO NOT HAND MIX**
- To begin the mixing process, add the proper amount of water:

For Each	Add
17lb (7.7 kg) - 2 gal. (7.6 L) bucket	1 U.S. quart (.95L) of water
51lb (23 kg) - 5 gal. (19.8 L) bucket	3 U.S. quarts (2.8L) of water

- The desired water temperature is between **65°F/18°C** and **75°F/24°C**.
- **After adding the water, it is very important to rapidly incorporate all of the dry Pavemend VR™ powders to achieve a uniform wet mixture within the first 30 seconds of mixing.**
- In ambient temperatures under 72°F/22°C, CERATECH highly recommends the use of a thermal gun or temperature probe to verify that a **Critical Mix Temperature of 80°F/27°C has been reached**. Place material into repair area when this temperature has been achieved.
- In ambient temperatures over 72°F/22°C and without using a thermal measuring gun or temperature probe, mix material for 4 1/2 minutes in ambient temperatures of 72°F/22°C to 80°F/27°C, mix for 3 1/2 minutes in ambient temperatures of 80°F/27°C to 90°F/32°C, mix for 3 minutes in ambient temperatures above 90°F/32°C and place.

### Mixing Notes:

**1. Pavemend VR™** undergoes an exothermic chemical reaction during blending. Heat, the by-product of the reaction, is the best indication that the reaction is complete and that the product is ready to be poured. **Pavemend VR™ has a Critical Mix Temperature of 80°F/27°C which MUST BE REACHED before pouring to obtain optimum performance.** (In cold weather, it may be impossible to reach the **Critical Mix Temperature**, therefore a 20°F rise in material temperature is mandatory to ensure that the necessary chemical reactions have taken place to deliver the desired performance characteristics); Mixing time to reach the **Critical Mix Temperature** will vary with ambient air and mix water temperatures, however, **never mix Pavemend VR™ for less than 3 minutes**. It is recommended that a thermal gun or temperature probe be used to ensure that the **Critical Mix Temperature** has been achieved.

### 2. Special instructions for cold weather mixing (Under 50°F):

- At temperatures of approximately 40°F, add a single unit of Pavemend VR Cold Weather Accelerant directly to material within bucket before adding mix water. Mix for 5 minutes. (If Pavemend VR Cold Weather Accelerant is not available, mix material for approximately 10 minutes or achieve a 20°F rise in material temperature.)
- At temperatures of approximately 50°F, add a single unit of Pavemend VR Cold Weather Accelerant directly to material within bucket before adding mix water. Mix for 4 minutes. (If Pavemend VR Cold Weather Accelerant is not available, mix material for approximately 8 - 9 minutes or achieve a 20°F rise in material temperature.)

## 6 Packaging & Shelf Life

### PACKAGING

17 lb (7.7 kg) 2 gallon (7.6 L) bucket

### SHELF LIFE

Buckets - 3 years (when stored in original unopened bucket)

### STORAGE

Buckets are environmentally sealed and require no special storage requirements

## 7 Limitations

- Not recommended for surface temperatures above **120°F/49°C** or below **40°F/10°C**.
- Will not bond to polymers.
- Pumping not recommended.

## 8 Application & Finish

- Working times are influenced by surface temperature and repair profile. **Working time can be extended by adding CERATECH's Set Retarder Admixture to mix water. (See Set Retardant product data sheet for more information)**
- Minimum profile thickness is 0.06" (1.5mm).
- Maximum profile thickness is not limited. When placing profiles greater than 4.00" (10 cm) layering is required to minimize sag.
- Scrub coats can be utilized when the host concrete is excessively dry or when very thin cosmetic applications are desired.
- **All existing control joints must be honored and re-established if necessary 1 - 3 hours from final set.**
- Finish the repair to the desired texture and / or to match the surrounding concrete. **DO NOT use additional water during the finishing process.**
- **Self-curing**
- Clean all tools and equipment with water prior to the material reaching final set.





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**8 Safety**

- See **Material Safety Data Sheet (MSDS)**.
- This document does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this document to establish appropriate safety and health practices and to determine the applicability of regulatory limitations prior to use.
- Dispose of water and materials in accordance with Federal, State and Local regulations.
- The use of a dust mask, safety goggles and gloves is recommended.
- Keep out of the reach of children.

**Attention!** To Ensure Performance **Read All pavement Mixing Instructions Prior To Using!**  
**Drill & Paddle Mixing Instructions** **Repair Area Must Be Clean & Mechanically Sound**

**1** Attach Mixing Paddle to Drill  
Use this style paddle only!  
Heavy Duty Drill (Min. 500 rpm) (Max. 800 rpm)

**2** Tumble *pavement* Bucket Several Times Prior To Opening To Break Up & Loosen Material

**3** Loosen Dry Powder with Drill Paddle.  
For best results, mix water temperatures should be between 65°F/18°C & 75°F/24°C

**4** Add 1 quart of water per 17 lb. unit or 3 quarts of water per 51 lb. unit of VR

**5** Mix To Critical Mix Temp.  
Use Thermal Measuring Gun To Verify Mix Temp.  
Without A Thermal Gun Match Ambient Temp To Mix Time (See Chart Below)

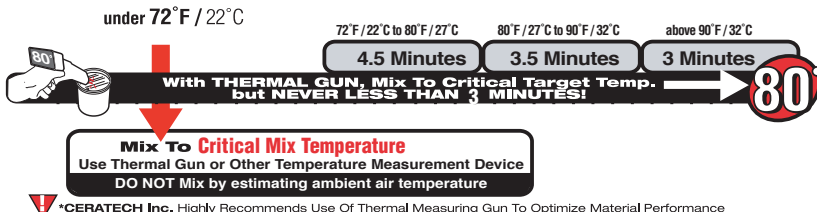
**6** Mix until Critical Mix Temperature is reached BUT NEVER LESS THAN 3 minutes

**7** Place *pavement* when Critical Mix Temperature is reached.  
(For thicker applications, allow material to slake / thicken to the desired consistency)  
DO NOT Finish with Water

**8** Promptly Rinse All Tools Before *pavement* Hardens On Tools

When Utilizing Forms, A Bond Release Agent Must Be Used

*pavement* Generates Heat Through a Chemical Reaction. Optimum Performance Is Dependent Upon Reaching Critical Mix Temperature



**!** For temperatures less than or equal to 50°F, see Special Cold Weather Mixing Instructions on page 2 of 3

**WARRANTY:**

CERATECH, Inc. ("CERATECH") warrants that its products are free from defects in materials and workmanship. If any CERATECH product fails to conform to this warranty, CERATECH will replace the product at no cost to the buyer or refund the purchase price, at CERATECH's election. Any warranty claim must be made within one (1) year from the date of the shipment of the product to the buyer. In no event shall CERATECH be liable to the buyer for any consequential or incidental damages of any nature. CERATECH MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED, WRITTEN OR ORAL AS TO THE MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OF ITS PRODUCTS AND EXCLUDES THE SAME. THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF.

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