RAPID PATCH®

Highway Repair

1. PRODUCT NAME
Rapid Patch® Highway Repair

2. MANUFACTURER
TCC Materials®
2025 Centre Pointe Blvd.
Mendota Heights, MN 55120 USA

Phone: 1.651.688.9116
Fax: 1.651.688.9164
Internet: tccmaterials.com

3. PRODUCT DESCRIPTION
Rapid Patch® Highway Repair is a rapid–setting, high–strength, polymer–modified, one–component hydraulic cement mortar designed for concrete repair and overlay applications requiring high durability. Meets or exceeds ASTM C928–R3 Standard Specification for Packaged, Dry, Very Rapid, Hardening Cementitious Materials for Concrete Repair. Resistant to salts, grease, oil, and other chemicals often found in the transportation environment.

Features and Benefits
- Polymer–modified for increased flexural strength and adhesion
- Excellent bond – no additional bonding agent needed
- Interior/exterior
- High early strength – over 4,000 psi (27.6 MPa) in 3 hours
- Wide temperature range for application: 20°F–100°F (–6°C–38°C)
- For repairs from 2" to 24" thick
- High performance cement technology helps improve impact, flexural, and tensile strengths
- Contains no chlorides or magnesium phosphates
- Compatible with Portland cement formulated concrete
- Cement based, non–corrosive, not a chemical concrete
- Integral corrosion inhibitor

Uses
- Highway repairs and overlays
- Bridge decks and parking structures
- Airport runways and taxiways
- Freezer rooms
- Heavy industrial and warehouse repairs
- Loading docks and wastewater treatment facilities

SAFETY
READ THE SAFETY DATA SHEET (SDS) BEFORE USING THIS PRODUCT. SDS information is available on our website: tccmaterials.com or contact TCC Materials® at 651–686–9116 (7:30 AM to 4:00 PM M–F, Central US Time).

CAUTIONS
Read complete cautionary information printed on product container prior to use.

This Product Data Sheet has been prepared in good faith on the basis of information available at the time of publication. It is intended to provide users with information about and guidelines for the proper use and application of the covered Rapid Patch® brand product (s) under normal environmental and working conditions. Because each project is different, neither Rapid Patch® nor TCC Materials® can be responsible for the consequences of variations in such conditions, or for unforeseen conditions.

4. TECHNICAL DATA

Test Results			
	Results	**ASTM C928–R2 Minimums**	**ASTM C928–R3 Minimums**
ASTM C109, Flow at 5 minutes	110%	100%	100%
Time of Setting ASTM C403			
Initial Set Time	22 minutes	No requirement	No requirement
Final Set Time	28 minutes	No requirement	No requirement
Rapid Chloride Permeability ASTM 1202			
28 Day Charge Passed	580 coulombs	No requirement	No requirement

4. TECHNICAL DATA (cont.)

Test Results			
Compressive Strength ASTM C109			
	Results	**ASTM C928–R2 Minimums**	**ASTM C928–R3 Minimums**
3 hours	>4,000 psi (27.6 MPa)	1,000 psi (6.9 MPa)	3,000 psi (20.6 MPa)
1 day	>4,500 psi (31.0 MPa)	3,000 psi (20.6 MPa)	5,000 psi (34.4 MPa)
7 days	>6.000 psi (41.4 MPa)	4,000 psi (27.5 MPa)	5,000 psi (34.4 MPa)
28 days	>8,000 psi (55.2 MPa)	≥ 28 day result	≥ 28 day result

Slant Shear Bond Strength ASTM C882		
	Results	**ASTM Minimums**
1 day	>1,750 psi (12.0 MPa)	1,000 psi (6.8 MPa)
7 days	>2,250 psi (15.1 MPa)	1,500 psi (10.3 MPa)

Flexural Strength ASTM C78		
1 day	>1,000 psi (6.9 MPa)	No requirement
7 days	>1,100 psi (7.6 MPa)	No requirement
28 days	>1,100 psi (7.6 MPa)	No requirement

Test Length Change of Hardened Cement Mortar and Concrete ASTM C928		
Change	Water storage	Air storage
28 days	+0.005%	–0.030%
ASTM C928 requirement	Max. to 0.15%	Max. to –0.15%

Resistance to Deicer Scaling ASTM C672		
25 cycles	0 rating	2.5 Max.

Rapid Freezing and Thawing ASTM C666 Average of 3 specimens	
No. of Cycles	Relative Dynamic Modulus (RDM)

Greater than: > Greater than or equal to: ≥ Less than: < Less than or equal to: ≤ Independent testing lab results @ 70°F (21°C). Test results obtained under controlled laboratory conditions. Reasonable variations can occur due to atmospheric and job site conditions. Water Used: 5.5 pt. (2.6 L) clean potable water per 50 lb. (22.7 kg) bag.

LEED® Eligibility[1]

- Regional Materials (MR–c5)

Packaging

- Gray: 50 lb. (22.7 kg) bag (BOM #114560)

Shelf Life

12 months from the date of manufacture when stored in the original, unopened container, away from moisture, under cool, dry conditions and out of direct sunlight.

5. INSTALLATION

Preparation

All materials should be conditioned to 40°F–75°F (4°C–24°C) 24 hours prior to installation. Proper surface repair preparation is crucial to achieving a successful application.

1. Surfaces must be solid, clean, and free of all bond breakers such as oil, grease, dirt, etc. Weak concrete surfaces must be cleaned down to solid sound concrete by mechanical means.
2. The base concrete should be roughened to enhance mechanical bond and repair areas should be in a saturated surface dry (SSD) condition with all standing water removed. Apply a bond scrub coat of thinly–mixed Highway Repair to the adjacent surfaces using a stiff broom or brush. Do not bond coat to dry before placing full patch.
3. A minimum patch repair depth of 2" (50.8 mm) is required. This is best accomplished by saw cutting the patch perimeter area to the minimum 2" (50.8 mm) depth.

Note: It is the responsibility of the installer/applicator to ensure the suitability of the product for its intended use.

Job Mockups

The manufacturer requires that when its Rapid Patch® products are used in any application or as part of any system that includes other manufacturers' products, the contractor and/or design professional shall test all the system components collectively for compatibility, performance and long–term intended use in accordance with pertinent and accepted industry standards prior to any construction. Written documentation of the tests performed shall be satisfactory to the design professional and contractor. Test results must include the means and methods of application, products used, project–specific conditions being addressed, and standardized tests performed for each proposed system or variation.

Mixing:

Mix as close to the area being repaired as possible. This is an accelerated setting product; do not set more than can be placed within 10 minutes. Mix in a mortar mixer or by using a paddle attached to a heavy–duty (650 rpm) ½ in. drill. Highway Repair requires only the addition of water.

- Begin with 3 pt. (1.42L) of water per 50lb. (22.7 kg) bag. If additional water is needed, add sparingly up to 3.25 pt. (1.54L)

Mix for 3–4 minutes to a lump–free consistency. Do not retemper or overwater. Place immediately after mixing, working firmly into the sides and bottom to eliminate air pockets and ensure bond. This is best achieved working from one side of the cavity to the other, then screeding toward the adjoining concrete. Placement must be continuous to prevent cold joints between pours.

Application

Idea application conditions are when air, material and substrate temperature are between 50°F–90°F (10°C–32°C). Apply a bond scrub coat of thinly–mixed Highway Repair to the adjacent surfaces using a stiff broom or brush. Do not allow bond coat to dry before placing full patch.

Hot and Cold Weather Applications:

Ideal mixed product temperature at placement is 65º–70ºF (18 –21ºC), where the initial setting time is 15–20 minutes. Hot temperatures will shorten setting time, while cold temperatures will extend setting time. Surfaces should be conditioned to between 35°F–90°F (2°C–32°C) at time of placement.

Hot Weather 80ºF–100ºF (27ºC–38ºC):

Keep Highway Repair cool. Pre–soak and then remove standing water from the repair area, resulting in a saturated surface dry (SSD) surface. Mix Highway Repair using chilled water to extend working time. The repair must be protected from rapid dry out with wet burlap or a water based curing compound.

Cold Weather 20ºF–40ºF (–7ºC–4ºC):

Do not use antifreeze or accelerators and keep Highway Repair warm. Heat the surrounding concrete until warm. Combine the warmed repair material with warm mixing water. After placing use a construction insulating blanket for at least 2–3 hours and keep material from freezing.

Refer to:

ACI 305 Standard on Hot Weather Concreting
ACI 306 Standard on Cold Weather Concreting

Limitations

- Do not use for applications less than 2 in. (50.8 mm) thick.
- Do not retemper after mixing.
- Do not overwater or add other cements or additives
- Protect from premature drying
- Placement should be continuous to avoid creating cold joints

Curing

Highway Repair should be moist cured for 1 hour after final set (approximately 18 minutes) or the application of a water–based curing compound is acceptable. Prolonged wet curing minimizes the chances of cracking and improves physical properties.

Cleaning

Use clean potable water to clean all tools immediately after use. Dried material must be mechanically removed. Use a waste water hardener (e.g. Conglez™ or similar product) for cementitious waste disposal.

Coverage

- Each 50 lb. (22.7 kg) bag yields approximately 0.4 cu. ft. (0.011 cu. m)

6. AVAILABILITY

To locate Rapid Patch® products in your area, please contact:

Phone: 1.651.688.9116
Email: info@tccmaterials.com

7. WARRANTY

Seller warrants that its product will conform to and perform in accordance with the product specifications. The foregoing warranty is in lieu of all other warranties, expressed or implied, including, but not limited to those concerning merchantability and fitness for a particular purpose. Because of the difficulty in ascertaining and measuring damages hereunder, it is agreed that Seller's liability to the Buyer shall not exceed the total amount billed and billable to the Buyer for the product hereunder.

8. MAINTENANCE

Not applicable.

9. TECHNICAL SERVICES

Technical Assistance:
Information is available by calling TCC Materials®
(hours 7:30 AM to 4:00 PM CST):

Phone: 1.651.688.9116
Email: info@tccmaterials.com
Web: tccmaterials.com

Technical and Safety Literature:
To acquire technical and safety literature, please visit our website at: tccmaterials.com.

10. FILING SYSTEM

Division 3

[1] Rapid Patch® products can contribute to LEED® credits within the Material Resource, (Recycled Content & Regional Materials) and Indoor Environmental Quality (Low Emitting Materials).

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