ThoRoc
Concrete Restoration Solutions

Concrete

HB2 REPAIR MORTAR

Two-component, polymer-modified, shrinkage-compensated high-build repair mortar

Features and Benefits

- Time/labor saving – can be applied up to 3" (76 mm) on vertical and 1-1/2" (38 mm) in overhead areas in one lift
- Shrinkage compensated – minimizes shrinkage and stresses on the bond line
- High bond strength – polymer component ensures excellent adhesion
- Low permeability – provides protection against carbon dioxide and chloride intrusion
- Durable – excellent freeze-thaw resistance
- Compatible – coefficient of thermal expansion similar to concrete
- Reliable – factory proportioned to overcome site-batched variations
- Suitable for hand/trowel and low velocity wet spray applications

Where to Use HB2 Repair Mortar

- Vertical and overhead concrete repairs
- Embedded steel reinforcement
- Where exceptional chloride and carbon dioxide resistance is required
- Interior or exterior

How to Apply HB2 Repair Mortar

Surface Preparation

Concrete

Concrete substrate must be structurally sound. Loose or unsound concrete should be hammered out. Saw cut the edges of the repair locations to a depth of at least 3/8" (10 mm) to avoid featheredging and to provide a square edge. Break out the complete repair area to a minimum depth of 3/8" (10 mm) up to the sawn edge. Clean the surface by removing any dust, unsound or contaminated material, plaster, oil, paint, greases, corrosion deposits or algae. Where breaking out is not required, roughen the surface and remove any laitance by mechanical means or high-pressure water wash. Oil and grease deposits, should be removed by steam cleaning, detergent scrubbing, or the use of a degreaser. To ensure optimum repair results, assess the effectiveness of decontamination by a pull-off test.

Steel

Expose fully to 100% of its circumference any corroded steel in the repair area and remove all loose scale and corrosion deposits. For maximum durability, steel should be cleaned to an SSPC-SP10, Near White Specification condition, paying particular attention to the back of exposed steel bars.

Reinforcing Steel

Remove all oxidation and scale from the exposed reinforcing steel in accordance with ICRI Technical Guideline No. 03730 "Guide for Surface Preparation for the Repair of Deteriorated Concrete Resulting from Reinforcing Steel Corrosion." For additional protection from future corrosion, coat the prepared reinforcing steel with Zincrich Rebar Primer or install Corr-Stops® CM.

Mixing

Ensure that ThoRoc™ HB2 Repair Mortar is thoroughly mixed. A forced action mixer is essential. Mixing in a suitably sized container using an appropriate paddle and variable speed (400/500 rpm) heavy-duty drill is acceptable for the occasional one-bag mix. Free-fall mixers should not be used and mixing of partial bags is not recommended. The material should always be mixed in a clean container. For normal applications, place 3 quarts (2.8 L) of ThoRoc™ Polymer Liquid into the clean mixer for each complete 45 lb. (20.5 kg) bag of HB2 Repair Mortar and mix for 3 - 5 minutes until fully homogeneous. Avoid overmixing. Note that the powder should always be added to the liquid. Depending on the ambient temperature and the desired consistency, additional ThoRoc™ Polymer Liquid may be added up to a maximum liquid content of 1 gallon (3.8 L) per 45 lb. (20.5 kg) bag of HB2 Repair Mortar.

Application

Substrate should be SSD (saturated surface dry) with no standing water. Using a stiff brush, scrub a thin coat of the mixed material thoroughly into the surface to ensure sufficient bonding. Before bond coat dries, thoroughly compact the mortar onto the substrate and around the exposed reinforcement.

HB2 Repair Mortar can be applied in sections up to a 3" (76 mm) thickness in vertical locations and up to a 1-1/2" (38 mm) thickness in overhead locations in a single lift and without the use of form work. Thicker sections should be built up in layers, but are sometimes possible in a single application depending on the actual configuration of the

repair area and the volume of exposed reinforcing steel. If sagging occurs during application, HB2 Repair Mortar should be completely removed and reapplied at a reduced thickness onto the correctly reprimed substrate.

HB2 Repair Mortar is finished by striking off with a straight edge and closing with a steel float. Wooden or plastic floats or sponges may also be used to achieve the desired surface texture. The completed surface should not be overworked.

Curing

Proper curing is extremely important. HB2 Repair Mortar should be cured immediately after finishing in accordance with good concrete practice (ACI 308) to approach peak performance of the repair. Proper curing is of particular importance when ambient conditions may cause rapid moisture loss (high temperature, low humidity, or moderate to high winds). The use of ThoRoc™ Acrylic Modifier, or an appropriate ASTM C 309 compliant curing compound, sprayed on to the surface of the finished repair in a continuous film, is recommended. Large areas of greater than 5 sq. ft. (0.47 sq. m) should be cured as troweling progresses without waiting for completion of the entire area. Other curing options include a fine mist of water, application of wet burlap (burlap must be kept continuously moist), application of polyethylene sheeting taped down at the edges, or a combination of the above to keep the finished repair moist for a minimum of 7 days. In cold conditions, the finished repair must be protected from freezing. If doubts arise concerning proper curing procedures, consult ACI guidelines.

Clean Up

HB2 Repair Mortar should be removed from tools, equipment and mixers with clean water immediately after use. Cured material can only be removed mechanically. Clean hands and skin immediately with soap and water or industrial hand cleaner.

For Best Performance

- Do not mix partial bags.
- Do not use in horizontal areas subjected to vehicular traffic.
- Do not expose to rain or moving water during application.
- Exposure to heavy rainfall prior to the final set may result in surface scour.
- In cold conditions down to 45°F (7°C), maintaining the ThoRoc™ Polymer Liquid at 80°F (26°C) is advisable to accelerate strength development. Normal precautions for working with cementitious materials in the winter should then be adopted. Do not apply if the temperature is expected to fall below 45°F (7°C) within 24 hours of application.
- At ambient temperatures above 80°F (26°C), the materials should be stored in the shade. Cooling the ThoRoc™ Polymer Liquid to 60°F (16°C) is recommended.
- Make certain the most current version of this data guide is being used; call Customer Service (1-800-433-9517) to verify the most current version.
- Proper application is the responsibility of the user. Field visits by ChemRex® personnel are for the purpose of making technical recommendations only and are not for supervising or providing quality control on the jobsite.

Technical Data

Physical Properties

- The following results were obtained with a liquid/ powder ratio of 3.7 quarts per 45 lb. (3.5 L per 20.5 kg) bag.

Description of Test	Test Method	Typical Results
Fresh wet density	ASTM C 138	105 lb./ft.^{3} (1,682 kg/m^3)
Pot Life 72°F (22°C), 50% relative humidity		1 hour
Set time 72°F (22°C), 50% relative humidity	ASTM C 191	Initial 3 hours Final 4 hours
Compressive strength 2 in. (51 mm) cubes	ASTM C 109	2,300 psi (15.9 MPa) @ 1 day 4,500 psi (31.0 MPa) @ 7 days 5,800 psi (40.0 MPa) @ 28 days
Compressive strength 3" x 6" (76 mm x 152 mm) cylinders	ASTM C 39	5,000 psi (34.5 MPa) @ 28 day
Flexural strength	ASTM C 348	1,000 psi (6.9 MPa) @ 28 days
Slant sheer bond strength	ASTM C 882 (modified[1])	1,750 psi (12.1 MPa) @ 7 days 2,400 psi (16.6 MPa) @ 28 days
Splitting tensile strength	ASTM C 496	300 psi (2.1 MPa) @ 7 days 500 psi (3.4 MPa) @ 28 days
Elastic modulus	ASTM C 469	2.0 x 10^6 psi (13.8 GPa)
Coefficient of thermal expansion[2] 1"(25mm) prisms	CRD C 39	4.5 x 10^{-6} in/in/°F (8.1 x 10^{-6} cm/cm/°C)
Drying shrinkage	ASTM C 157	350, μstrain @ 28 days
Freeze-thaw resistance	ASTM C 666	100% RDM[3] @ 300 cycles
Rapid chloride permeability	ASTM C 1202	941 coulombs (very low)

All application and performance values are typical for the material, but may vary due to variations in the test method, conditions, and configurations.

[1]No bonding agent, scrubbed into prepared surface

[2]Portland cement concrete, typical range is 4.0 - 8.0 x 10^{-6} in/in/°F (7.2 – 14.4 x 10^{-6} cm/cm/°C) per American Concrete Institute

[3]RDM = Relative dynamic modulus

Order Information

Packaging

HB2 Repair Mortar

- #1 Kit 45 lb. (20.4 kg) powder
  1 gallon (3.8 L) liquid
- #2 Kit 225 lb. (102 kg) powder
  5 gallon (18.9 L) liquid

Shelf Life

- HB2 Repair Mortar has a shelf life of 12 months when transported and stored in cool, dry conditions between 40°F (4°C) and 85°F (29°C) in the original, unopened containers.

Coverage

- #1 Kit (0.015 m^3 per 45 lb. bag) 0.50 ft.^{3}
- #2 Kit (0.076 m^3 per 225 lb. bag) 2.50 ft.^{3}

Caution

HB2 Repair Mortar contains crystalline silica, Portland cement

Risks

Product is alkaline on contact with water and may cause injury to skin or eyes. Ingestion or inhalation of dust may cause irritation. Contains free respirable quartz, which has been listed as a suspected human carcinogen by NTP and IARC. Repeated or prolonged overexposure to free respirable quartz may cause silicosis or other serious and delayed lung injury.

Precautions

KEEP OUT OF THE REACH OF CHILDREN. Prevent contact with skin and eyes. Prevent inhalation of dust. DO NOT take internally. Use only with adequate ventilation. Use impervious gloves, eye protection and if the TLV is exceeded or used in a poorly ventilated area, use NIOSH/MSHA approved respiratory protection in accordance with applicable federal, state and local regulations.

First Aid

In case of eye contact, flush thoroughly with water for at least 15 minutes. SEEK IMMEDIATE MEDICAL ATTENTION. In case of skin contact, wash affected areas with soap and water. If irritation persists, SEEK MEDICAL ATTENTION. Remove and wash contaminated clothing. If inhalation causes physical discomfort, remove to fresh air. If discomfort persists or any breathing difficulty occurs or if swallowed, SEEK IMMEDIATE MEDICAL ATTENTION.

For more information see Material Safety Data Sheet (MSDS) for this product.

Proposition 65

This product contains material listed by the state of California as known to cause cancer, birth defects or other reproductive harm.

VOC Content

This product contains 0 g/L or 0 lbs./gallon.

For medical emergencies only, call ChemTrec (1/800/424-9300).

ThoRoc™
Concrete Restoration Solutions

ChemRex®

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