

ChemMasters

Installation Guidelines

ChemPatch VO1 is a one component, polymer modified, fast setting, nonshrink repair mortar. ChemPatch VO1 is a proprietary structural repair compound unique for its light concrete color and finishing characteristics.

1.0 General

1.1 Scope

This specification covers the performance characteristics and application procedures for rapid structural and cosmetic repairs to concrete beams and columns. Materials used and application techniques must provide a smooth and level floor surface.

1.2 Material Description

The repair mortar shall be a polymer modified, fast setting, cementitious compound, requiring only the addition of water. Material shall be able to be installed by pouring or pumping.

1.3 Typical Applications

- A. Rapid structural and cosmetic repairs to concrete beams and columns.
- B. Filling construction faults in concrete-tie wire and spreader holes, spalls, cracks, honeycombs.
- C. Repairing concrete pipe, tunnels, viaducts, walls, parapets, curbs, sidewalks, steps, precast panels, columns and beams.
- D. Restoring disintegrated surfaces of old concrete and masonry, cornices, lintels, sills, handrails.

1.4 Limitations

- A. ChemPatch VO1 hardens in 20 minutes. Prepare only enough for immediate use.
- B. Do not use solvent based curing compounds..
- C. Do not apply to frozen or frosted surfaces, warm substrate to a minimum of 40 °F./4 °C. prior to application. Do not apply if ambient or substrate temperatures are below 40 °F/4 °C.
- D. Do not add sand or gravel to extend. Do not use any admixtures other than those recommended by ChemMasters.

1.5 Quality Assurance

The repair contractor shall have experience and proficiency specific to the repair type and shall be approved by the engineer and the material supplier. The material supplier shall provide job service as required to assure proper handling

and installation of materials. The field representative shall instruct as needed to assure that handling, mixing, placing and finishing of materials are in accordance with specifications.

1.6 Delivery, Storage and Handling

A. The product shall be delivered in the original, unopened containers. It shall be labeled with the manufacturer's name, product name and lot number.

B. Optimum storage temperatures are between 40 °-90 °F/4 °-32° C. Store unopened bags on pallets in dry area. Shelf life of properly stored material is one year from date of manufacture.

1.7 Environmental Requirements

All materials used for the repair work shall be VOC compliant. The manufacturer shall supply the appropriate material safety data sheets upon request.

1.8 Site Conditions

Job conditions shall be maintained at standards that allow resurfacing within temperature and cleanliness requirements. Unusual conditions as uncovered during the course of work shall be brought to the engineer's attention for analysis and disposition. These conditions include but are not limited to poor quality base concrete, random cracks and deep oil penetration.

2.0 Materials

2.1 Approved Materials and Manufacturers

2.1.1 Product Standard

ChemPatch VO1, as manufactured by ChemMasters, 300 Edwards Street, Madison, Ohio, 44057-3112, 1-800-486-7866, is considered to conform to the requirements of this specification shall be the repair mortar. ChemPatch VO1 is a cementitious, one-component, polymer modified, fast setting, non-shrink repair mortar. It is specifically designed for application as a structural repair compound for virtually permanent and cosmetic repairs.

2.1.2 Substitutions

No submittals for substitutions will be accepted after the bid date. All submittals must be made in writing to the engineer with supporting technical data sheets and test data showing complete equivalent performance.

2.2 Packaging/Coverage/Estimating

2.2.1 Packaging

A. ChemPatch VO1 is available in 50 lb./22.7 Kg polylined, moisture proof bags shipped 60 bags per pallet shrink wrapped.

2.2.2 Coverage/Estimating

- A. 50 lbs with 3.5 quarts water yields approximately 0.45 ft.³
- B. 22.7 Kg with 3.2 liters water yields approximately 0.014 m³
- C. Water requirement per bag 3.25-3.5 qts 3.1-3.3 Liters
- D. Color Light Concrete Gray

2.3 Engineering Properties

Data shown based on independent laboratory tests. As a result of environmental and jobsite conditions, actual results may vary slightly.

2.3.1 Plastic Properties

2.3.1.1 Working Time @70 °F./21.1 °C.20 minutes minimum

2.3.2 Hardened Properties

2.3.2.1 Compressive Strength (ASTM C-109) psi MPa

- A. 1 hour 2400 16.77
- B. 1 day 4030 27.81
- C. 7 days 5060 34.91
- D. 28 days 5550 38.30

2.3.2.2 Flexural Strength (ASTM C-348): 28 days 800 5.52

2.3.2.3 Modulus of Elasticity-Extended (ASTM C-469): 3.6X10⁶ psi 24.84GPa

2.3.2.4 Bond Strength-Slant Shear (ASTM C-882Mod)

- A. 1 day 1600 11.04
- B. 28 days 1930 13.32

2.3.2.5 Split Tensile Strength (ASTM C-496)

- 7 days 580 4.00
- 28 days 620 4.28

2.3.2.6 Initial Plastic Shrinkage (ASTM C-1090): -0.08%

2.3.2.7 Shrinkage (ASTM C-490)

- A. 28 days 50%RH -0.10%

2.3.2.8 Expansion (ASTM C-490)

- 28 days 100%RH +0.03%

2.3.2.9 Freeze/Thaw Durability (NYSDOT Test Method 502-3P): 1.7% loss after 50 cycles

2.4 Accessory Materials as manufactured by ChemMasters, 300 Edwards Street, Madison, Ohio, 44057-3112, 1-800-486-7866, is considered to conform to the requirements of this specification.

3.0 Execution

3.1 References

A. Refer to product MSDS and Technical Data Sheets

3.2 Substrate Preparation:

A. Surface to be repaired must be free of all dust, dirt, loose concrete, oil, grease, old asphalt, curing and sealing compounds, form release agents, efflorescence, or other contaminants which might interfere with adequate bond.

B. Square cut perimeter of holes or cracks to a minimum width of 3/4"/1.9 cm and depth of 1"/2.5 cm, undercutting to sound concrete when possible. Do not V cut cracks.

C. Exposed reinforcing steel must be cleaned to bright metal, removing all rust or signs of oxidation.

D. Chip out concrete behind or under rebar to a depth of 3/4"/1.9 cm.

E. Coat clean metal with Polytops HMMV Epoxy to prevent further oxidation and deterioration.

F. Immediately prior to placement of ChemPatch VO1, remove any remaining dust or dirt with vacuum or oil free compressed air. Saturate surface with clean, potable water to the point of rejection. Remove standing water or puddles.

3.3 Mixing:

A. ChemPatch VO1 sets rapidly, mix only an amount that can be placed and leveled within 15-20 minutes.

B. Condition the dry mortar and water to 65° -75° F./18.3° -23.8° C. Do not add accelerating or bonding admixtures.

C. Do not add additional water or retemper after initial mixing procedure.

D. Depending on the size of the area to be repaired, use a drill with a jiffler paddle to mix a proportionate amount of the dry ChemPatch VO1 powder with clean water to use as a bond coat.

E. Scrub bonding mixture into the repair area being sure to fill all voids and pores. Coat any exposed reinforcing steel with bond coat. Do not allow bond coat to dry before placement of mortar.

F. To make mortar, measure 3.25 to 3.5 quarts/3.1 to 3.3 liters into a clean mixing container, add 50lbs/22.7Kg of ChemPatch VO1 to water and mix with high RPM, low speed drill with paddle for 1-2 minutes. Do not over mix.

3.4 Application:

A. Due to its rapid setting characteristics, place ChemPatch VO1 mortar in lifts of not more than 1"to 2"/2.5-5.0 cm. Compact mortar firmly into repair area filling all voids and air pockets, paying special attention to spaces beneath any reinforcing steel. The top surface of each lift must have a 1/8"-1/4"/.31-.62 cm raked profile.

B. Keep surface of lift damp with fog spray, sprinkler hose or brush.

C. Apply next layer within 15-20 minutes. When design depth is obtained, finish final placement to match surrounding surface texture.

3.5 Curing

A. ChemPatch VO1 continues to gain strength as long as it is damp. It generates considerable heat when used in quantity. Keep cool by wetting. Repaired areas should be kept damp for 20-30 minutes or cured with a water based curing compound such as Safe-Cure &Seal 20 or 0800.

B. ChemPatch VO1 gains strength rapidly. Light foot traffic may be allowed in approximately 1 hour.

3.6 Special Applications

A. Above Normal Temperatures:

1. At temperatures exceeding 40° F /26.7° C., cool surface to be patched with cool, clean, tap water. Keep material in cool place and use cold mixing water. Mix small batches that can be used quickly.

2. Below Normal Temperatures: During 50 ° -60 °F./10°- 15° C. weather keep material warm and use lukewarm water to speed set.

B. Bonding:

1. When undercutting or squaring of the edges of the patch is impractical or when application must be made in hot or dry conditions, use Cretelox as the mixing liquid for the slush bond coat. Do not allow slush bond coat to dry out before application of the mortar. Use 1 part Cretelox: 2 part water as the mixing liquid for the mortar consistency ChemPatch VO1. Refer to Cretelox product data sheet.

C. Vertical/Overhead: Adjust consistency by using less water to make a stiffer mix.

D. Shotcreting: Follow typical procedures as with a shotcreted mortar.

3.7. CLEAN-UP

Before ChemPatch VO1 dries and hardens, use water to clean tools and equipment.

