

## SECTION 035416

### HYDRAULIC CEMENT UNDERLAYMENT

#### PART 1 GENERAL

##### 1.1 SECTION INCLUDES

- A. TEC® Fiber-Reinforced Self-Leveling Cement Based Underlayment
- B. CHAPCO® EXTREME FIBER SLU Fiber-Reinforced Self-Leveling Underlayment
- C. TEC Multipurpose Primer
- D. CHAPCO® MP Multipurpose Primer

##### 1.2 RELATED SECTIONS

- A. Section 03300 - Cast Underlayment Concrete
- B. Section 09000 - Finishes

##### 1.3 REFERENCES

- A. ASTM C 109 Modified - Compressive Strength of Hydraulic Cement Mortars
- B. ASTM C 580 Flexural Strength
- C. ASTM C 531 (modified) Shrinkage
- D. ASTM D 3931 Bond Strength (concrete)
- E. ASTM F 1869 Standard Test for measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride
- F. ASTM F 2170 Relative Humidity in Concrete

##### 1.4 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Manufacturer's MSDS and Product Data Sheets on each product to be used, including:
  - 1. Surface preparation instructions and recommendations.
  - 2. Storage and handling requirements and recommendations.
  - 3. Installation methods.

##### 1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing Products specified in this section.
- B. *Installer Qualifications:* Firm specializing in installation of cementitious underlayments and toppings, with minimum 5 years documented experience with projects of similar scope, design, and materials. Installation of the HB Fuller Construction products must be completed by a factory-trained applicator, **INSTALL Substrate Prep Certified Installer**, or equal, using mixing equipment and tools approved by the manufacturer.
- C. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
- D. Prepare area designated by Architect.
- E. Mock-up area shall be 6 feet by 6 feet (1.83 m by 1.83 m).
- F. Do not proceed with remaining work until workmanship, is approved by Architect.
- G. Incorporate mock-up into final construction upon approval.
- H. Warranty: Product shall be free from manufacturing defects and will not break down or deteriorate under normal use for 10 years.

## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Comply with requirements of section 01650 and section 01660.
- B. Store products in manufacturer's unopened packaging until ready for installation.
- C. Store products in a cool dry place out of direct sunlight.
- D. Maximum shelf life is 6 months from date of manufacture in unopened containers.

## 1.7 PROJECT CONDITIONS

- A. For interior application only.
- B. Do not install below 43 degrees F substrate temperature.
- C. Not for use in conditions of hydrostatic pressure or excessive moisture readings above 15 pounds per 1000 sq. ft. per 24 hours per ASTM F 1869 (>95% Relative Humidity per ASTM F2170). Readings above 95% RH and 15#/1000/24 hrs. up to and including readings of 25#/1000/24hrs and 100% RH require use of TEC® LiquiDam™, CHAPCO'S DEFENDER two-part 100% solids epoxy; CHAPCO® DEFENDER EZ™ or TEC® LiquiDam EZ™ 1-part, polymeric emulsion as manufactured by H.B. Fuller Construction Products. Readings above flooring manufacturers recommended levels also requires the use of moisture mitigation vapor barrier.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. Acceptable Brand/Manufacturer: TEC® or Chapco®/H.B. Fuller Construction Products Inc.; 1105 S. Frontenac Street, Aurora, IL 60504. Tel: 800-832-9023. Fax: 800-952-2368. Web: [www.tecspecialty.com](http://www.tecspecialty.com) or <http://www.chapco-adhesives.com>
  1. TEC® Fiber-Reinforced Underlayment
  2. CHAPCO® EXTREME FIBER SLU Fiber-Reinforced Self-Leveling Underlayment

**\*\* NOTE TO SPECIFIER \*\* Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.**

- B. Substitutions: Not permitted.
- C. Requests for substitutions will be considered in accordance with provisions of Section 01600.

### 2.2 MATERIALS

- A. Technical Data:
  1. Compressive Strength: 6,000 psi @ 28 days (Air curing samples) when tested in conformance with ASTM C 109.
  2. Flexural Strength: 1,200 psi @ 28 days when tested in conformance with ASTM C 580.
  3. Shrinkage: 0.025 - 0.045% @ 28 days when tested in conformance with ASTM C 531 (modified).
  4. Ideal Slump range 10.5" - 11.5" (2" diameter pipe, 4" high).
  5. Bond Strength: 350 - 400 psi when tested in conformance with ASTM D 3931.
  6. Walkable hardness: 2 - 4 hours.
  7. Finish flooring installation: Permeable coverings 6 hours, Non-permeable coverings 12 - 24 hours.
  8. Working Time: 15 -20 minutes at 70 degrees F (21 degrees C).
  9. "0" VOC
  10. Minimum 10% recycled content.

- B. Primer: TEC Multipurpose Primer or Chapco MP Multipurpose
  - 1. Primer shall have “0” VOC.
- C. Aggregate shall be well graded, washed pea gravel, 1/8 inch or larger. Use for underlayment installed in thicknesses over 1½ inch thick.
- D. Water shall be clean and potable.
- E. Moisture mitigation: TEC® LiquiDam™, CHAPCO’S DEFENDER two-part 100% solids epoxy; CHAPCO® DEFENDER EZ™ or TEC® LiquiDam EZ™ 1-part, polymeric emulsion
  - 1. 100% solids epoxy or polymeric emulsion
  - 2. “0” VOC
  - 3. Use for applications reading up to and including 25 lbs. per 1000 sq. ft. per 24 hours vapor emission per ASTM F 1869, or 100% relative humidity per ASTM F2170.

## **2.3 MIXING**

- A. Mix materials in accordance with manufacturer's instructions.
- B. Standard Mix: Mix in accordance with manufacturer’s instructions.
  - 1. Slowly add a 50 lb. bag into water while mixing.
  - 2. Use 5.0 – 5.25 quarts (4.7-5.0 L) of water per 50 lb. bag
  - 3. Use cool water not over 70 degrees F.
  - 4. Mix using a 1/2-inch heavy-duty drill with blending paddle at a minimum of 650 rpm. Mix thoroughly for approximately 2 - 3 minutes. Scrape containers sides and remix to ensure a lump-free consistency.
- C. Aggregate Mix: For areas to be installed over 1½ inch thick.
  - 1. Mix as specified for standard mix.
  - 2. Add from 1/3 to 1 part by volume of 1/8 inch or larger aggregate and mix thoroughly to evenly coat all aggregate.
  - 3. Do not use sand.
- D. Pumped Mix:
  - 1. Mix as specified for standard mix. Do not over water.
  - 2. Check the consistency of the product with a Slump test.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- A. Test moisture content of substrates:
  - 1. Per ASTM F2170, do not install if relative humidity is > 95% and <= 100% without first applying moisture mitigation vapor barrier as specified per instructions and limitations.
  - 2. For moisture sensitive floor finishes refer to the finish floor manufacturers specifications for moisture limitations. Remediation of excessive moisture conditions must be done prior to installation of Self Leveling Underlayment. To reduce moisture vapor emissions to an acceptable level, use moisture mitigation vapor barrier as specified.
- B. Notify the Architect and General Contractor in writing of any unsatisfactory conditions.

### **3.2 PREPARATION**

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

1. All surfaces shall be structurally sound and free from any contaminants that may inhibit bond, including oil, grease, dust, loose or peeling paint, sealers, floor finishes, curing compounds or other contaminants.
  2. Concrete subfloors and other subfloors such as ceramic and quarry tile as well as Cement terrazzo should be clean and free of all waxes and sealers. Mechanically clean if necessary using shot blasting or other methods.
  3. Wood sub-flooring must be securely fastened with screws or ring shank nails and adhesive. Installation of exterior grade plywood or OSB (APA rated Sturdi –I-Floor OSB, Exposure 1 or better) require 3/4" (19mm) minimum thickness on bridged joists up to 24" on center with a maximum deflection of L/360 of the span. Allow a gap of 1/8" to 1/4" (3-6mm) between sheets. Long edges of sub-floor must be tongue and groove or supported by bridging between the floor joists. Plug all floor openings, gaps and cracks then install termination dams to prevent any seepage. Prime the floor. Allow primer to dry to a clear film. Next staple 3/4" (6mm) galvanized diamond metal or plastic lath to the floor overlapping at seams. Maximum installation thickness is 1½"; minimum thickness is limited by joint spacing.
    - a) 3/8" (9mm) for joists 16" OC or less
    - b) 1/2" (12mm) for joists 16" to 20"
    - c) 5/8" (15mm) for joists 20" to 24"
  4. For installation over cutback adhesive, remove adhesive by scraping until all that remains is a thin transparent layer of adhesive residue.
- C. Joint Preparation: Repair and reinforce all cracks in the subfloor to minimize telegraphing through the underlayment.
1. Do not cover existing building expansion or control joints.
  2. Create 1/8" to 1/4" wide gaps where self-leveling abuts walls, columns, and fixtures by installing a self-sticking foam weather-stripping tape or damp sand.
- D. Seal all floor openings.

### 3.3 APPLICATION OF PRIMER

- A. Install products in accordance with manufacturer's instructions.
- B. Prime standard subfloors with Primer.
  1. Mix Primer 1:3 with water and apply evenly with a paintbrush, short nap roller or soft bristled push broom.
  2. Apply an even continuous coat.
  3. Allow to dry to a clear film (typically 1 - 3 hours).
  4. Do not apply underlayment until the primer is dry.
  5. Primer coverage is approximately 400 to 450 sq. ft. per gallon depending on surface texture.
- C. Prime extremely absorbent subfloors twice.
- D. Prime 2-part, 100% Epoxy moisture mitigation vapor barrier or cutback adhesive residues over concrete as follows (no need to primer 1-part, polymeric emulsion moisture mitigation vapor barrier):
  1. Prime with Primer (undiluted).
  2. Apply evenly with a paintbrush, short nap roller or soft bristled push broom.
  3. Apply an even continuous coat.
  4. Allow to dry to a clear film (typically 1 - 3 hours).
  5. Do not apply underlayment until the primer is dry.
  6. Primer coverage is approximately 140 square feet per gallon.

### 3.4 APPLICATION OF UNDERLAYMENT

A. Placing:

1. Mix underlayment as specified.
2. Immediately Pour or pump the underlayment onto the primed flooring substrate.
3. Spread in place with a long handled, gauged spreader or smoother covering all high spots on the floor.
4. Underlayment can be walked on in 2 - 4 hours at 70 degrees F.

B. Preparation for Finish Flooring Installation:

1. Underlayment can accept permeable coverings after 6 hours and non-permeable coverings after 12 - 24 hours at 70 degrees F and 50 percent relative humidity.
2. Due to the wide range of adhesives that are used to install floor coverings, some adhesives may dry more quickly over underlayment than over other substrates.

### 3.5 PROTECTION

- A. Protect installed products until completion of project.
- B. Do not permit traffic over unprotected floor underlayment surfaces.

**END OF SECTION**