Specifier Notes: This product guide specification is written according to the Construction Specifications Institute (CSI) 3-Part Format. The section must be carefully reviewed and edited by the Architect or Engineer to meet the requirements of the project and local building code. Coordinate this section with other specification sections and the drawings. Delete all "Specifier Notes" when editing this section.

SECTION 03930

CONCRETE REPAIR MORTAR

Specifier Notes: This section covers Euclid "Euco #456 Mortar", "Thin-Top Supreme", "Concrete-Top Supreme", "Euco-Speed MP", "Eucopatch" and "VersaSpeed" trowel-grade concrete repair mortars for horizontal surfaces. Consult Euclid for assistance in editing this section for the specific application.

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Trowel-grade concrete repair mortar for horizontal surfaces.

1.2 RELATED SECTIONS

Specifier Notes: Edit the following list of related sections as required for the project. List other sections with work directly related to this section.

A. Section 03300 - Cast-in-Place Concrete.

1.3 REFERENCES

Specifier Notes: Include only the references used with the specified materials in PART 2 - PRODUCTS. Delete the other references.

A. ASTM C 78 - Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading).

B. ASTM C 109 - Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50-mm] Cube Specimens).

C. ASTM C 266 - Time of Setting of Hydraulic-Cement Paste by Gillmore Needles.

D. ASTM C 348 - Flexural Strength of Hydraulic-Cement Mortars.

E. ASTM C 579 - Compressive Strength of Chemical-Resistant Mortars, Grouts, Monolithic Surfacings and Polymer Concretes.

F. ASTM C 666 - Resistance of Concrete to Rapid Freezing and Thawing.

G. ASTM C 881 - Epoxy-Resin-Base Bonding Systems for Concrete.

H. ASTM C 882 - Bond Strength of Epoxy-Resin Systems Used With Concrete By Slant Shear.

I. ASTM C 928 - Packaged, Dry, Rapid-Hardening Cementitious Materials for Concrete Repairs.

J. ASTM C 1042 - Bond Strength of Latex Systems Used With Concrete By Slant Shear.

K. ASTM C 1059 - Latex Agents for Bonding Fresh To Hardened Concrete.

L. ASTM C 1202- Rapid Chloride Permeability

1.4 SUBMITTALS

A. Comply with Section 01330 - Submittal Procedures.

B. Product Data: Submit manufacturer's product data, including surface preparation and placement instructions.

C. Manufacturer's Certification: Submit manufacturer's ISO 9001/9002 certification.

1.5 QUALITY ASSURANCE

A. Manufacturer's Qualifications: ISO 9001/9002 registered or provide proof of documented quality assurance system. Quality assurance system shall be registered by independent registrar accredited by ANSI Registrar Accreditation Board (ANSI-RAB) or by another internationally recognized body.

Specifier Notes: Describe requirements for a meeting to coordinate the placement of the concrete repair mortar and to sequence related work.

B. Pre-placement Meeting: Convene a pre-placement meeting [2 weeks] [_____] before start of placement of concrete repair mortar. Require attendance of parties directly affecting work of this section, including Contractor, Engineer, and manufacturer's representative. Review surface preparation, mixing, placement, finishing, curing, protection, and coordination with other work.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.

B. Storage:
1. Store materials in clean, dry area in accordance with manufacturer's instructions.
2. Keep containers sealed until ready for use.

Specifier Notes: Include the following sentence when specifying Euco #456 Mortar.

3. Store between 60 degrees F (16 degrees C) and 70 degrees F (21 degrees C) for 24 hours before use.

C. Handling: Protect materials during handling and placement to prevent damage or contamination.

1.7 ENVIRONMENTAL REQUIREMENTS

Specifier Notes: Include the following sentence when specifying Thin-Top Supreme.

A. Do not place concrete repair mortar when concrete surface or air temperatures are below 45 degrees F (7 degrees C) or above 100 degrees F (38 degrees C).

Specifier Notes: Include the following sentence when specifying Concrete-Top Supreme or Eucopatch.

B. Do not place concrete repair mortar when concrete surface or air temperatures are below 45 degrees F (7 degrees C).

Specifier Notes: Include the following two sentences when specifying Euco-Speed MP.

C. Do not place or cure concrete repair mortar when concrete surface or air temperatures are below 0 degrees F (-17 degrees C).

PART 2 PRODUCTS

2.1 MANUFACTURER

A. The Euclid Chemical Company, 19218 Redwood Road, Cleveland, Ohio 44110. Toll Free (800) 321-7628. Phone (216) 531-9222. Fax (216) 531-9596. Web Site www.euclidchemical.com.

2.2 CONCRETE REPAIR MORTAR

Specifier Notes: Specify Euco #456 Mortar, Thin-Top Supreme, Concrete-Top Supreme, Euco-Speed MP, or Eucopatch concrete repair mortar.

A. Concrete Repair Mortar: Euco #456 Mortar.
   1. Description: 3-component, trowel-applied, wear-resistant, epoxy mortar floor slab overlay.
   2. Compliance: ASTM C 881, Types II and IV, Grade 1, Classes B and C.
   3. Compressive Strength, ASTM C 579, 2-Inch (50-mm) Cubes:
      a. 1 Day: 10,000 psi (69 MPa).
      b. 28 Days: 15,000 psi (103 MPa).

B. Concrete Repair Mortar: Thin-Top Supreme.
   1. Description: 1-component, latex and microsilica-modified, cement-based mortar deck resurfacer.
   2. Compliance:
      a. Bond Strength: ASTM C 1059, Type II.

3. Compressive Strength, ASTM C 109, 2-Inch (50-mm) Cubes:
   a. 1 Day: 3,000 psi (20.7 MPa).
   b. 28 Days: 7,200 psi (49.6 MPa).
4. Flexural Strength, ASTM C 348:
   a. 3 Days: 800 psi (5.5 MPa).
   b. 28 Days: 1,000 psi (6.9 MPa).
5. Bond Strength, ASTM C 882 Modified:
   a. 1 Day: 1,000 psi (6.9 MPa).
   b. 28 Days: 2,500 psi (17.2 MPa).

C. Concrete Repair Mortar: Concrete-Top Supreme.
1. Description: 1-component, latex and microsilica-modified, cement-based mortar deck repair.
2. Compliance:
   a. Bond Strength: ASTM C 1059, Type II.
3. Compressive Strength, ASTM C 109, 2-Inch (50-mm) Cubes:
   a. 1 Day: 4,000 psi (27.6 MPa).
   b. 28 Days: 10,200 psi (70.3 MPa).
4. Flexural Strength, ASTM C 348:
   a. 3 Days: 850 psi (5.9 MPa).
   b. 28 Days: 1,200 psi (8.3 MPa).
5. Bond Strength, ASTM C 882 Modified:
   a. 1 Day: 1,200 psi (8.3 MPa).
   b. 28 Days: 2,500 psi (17.2 MPa).

D. Concrete Repair Mortar: Euco-Speed MP.

Specifier Notes: Specify Euco-Speed MP Hot Weather when mortar is to be placed in hot weather over 85 degrees F (29 degrees C). Also specify Euco-Speed MP Hot Weather along with the use of cold water to extend setting time for large placements regardless of the temperature. Consult Euclid for additional information.

1. Description: 1-component, rapid-setting, magnesium phosphate patching mortar.
2. Compliance:
   a. Very Rapid Hardening Category: ASTM C 928.
3. Compressive Strength, ASTM C 109, 2-Inch (50-mm) Cubes, 72 Degrees F (22 Degrees C):
   a. 1 Day: 6,000 psi (41 MPa).
   b. 28 Days: 7,500 psi (52 MPa).
4. Flexural Strength, ASTM C 78:
   a. 4 Hours: 400 psi (2.8 MPa).
   b. 3 Days: 500 psi (3.4 MPa).
5. Bond Strength, ASTM C 882 Modified:
   a. 1 Day: 1,300 psi (9 MPa).
   b. 28 Days: 1,700 psi (12 MPa).
6. Freeze/Thaw Resistance, ASTM C 666, Procedure A, 300 Cycles:
   a. Relative Durability Modulus: 93 percent.

7. Setting Time, Gillmore Needles:
   a. Initial Set: 8 to 12 minutes.
   b. Final Set: 12 to 20 minutes.

E. Concrete Repair Mortar: Eucopatch.
1. Description: 1-component, rapid-setting repair mortar.
2. Compressive Strength, ASTM C 109, 2-Inch (50-mm) Cubes:
   a. 1 Day: 2,000 psi (14 MPa).
   b. 28 Days: 5,500 psi (38 MPa).
3. Bond Strength, ASTM C 1042:
   a. 28 Days: 1,400 psi (10 MPa).
4. Setting Time, ASTM C 266, 70 Degrees F (21 Degrees C).
   a. Initial Set: 10 minutes.
   b. Final Set: 25 minutes.

F. Concrete Repair Mortar: VersaSpeed.
1. Description: 1-component, rapid-setting repair mortar.
2. Compressive Strength, ASTM C 109, 2-Inch (50-mm) Cubes:
   a. 3 hour: 3,500 psi (24.1 Mpa).
   b. 1 Day: 5,500 psi (37.9 MPa).
   c. 7 Days: 8,500 psi (58.6 Mpa).
   d. 28 Days: 10,000 psi (68.9 MPa).
3. Flexural Strength, ASTM C 348:
   a. 1 Day: 850 psi (5.9 MPa).
   b. 7 Days: 1,000 psi (6.9 MPa).
   c. 28 Days: 1,100 psi (7.6 MPa).
4. Setting Time, ASTM C 266, 72 degrees F (22 degrees C).
   a. Initial Set: 15 - 30 minutes.
   b. Final Set: 20 - 40 minutes.

5. Slant Shear Bond: ASTM C 882
   a. 1 Day: >2,500 psi (17.2 Mpa).
   b. 7 Days: >2,900 psi (20 Mpa).
   c. 28 Day: >3,100 psi (21.4 Mpa).

6. Rapid Chloride Permeability: ASTM C 1202
   a. 28 Days: 960 Coulombs “Very Low”.

G. Water: Clean and potable.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine surfaces to receive concrete repair mortar. Notify Engineer if surfaces are not acceptable. Do not begin surface preparation or placement until unacceptable conditions are corrected.

3.2 SURFACE PREPARATION

A. Prepare concrete surfaces in accordance with manufacturer's instructions.

Specifier Notes: Specify a minimum of 3 days for Thin-Top Supreme and Eucopatch. Specify a minimum of 28 days for Euco #456 Mortar. Specify a minimum of 3 days if a product bond coat is used to bond the Concrete-Top Supreme. Specify a minimum of 28 days if an epoxy adhesive will be used to bond the Concrete-Top Supreme.

B. Ensure concrete is a minimum of [3] [28] days old.

C. Ensure concrete surfaces are clean and rough.

D. Remove dirt, dust, oil, grease, debris, paint, curing compounds, sealers, and unsound concrete.

E. Prepare surfaces mechanically to give a surface profile of a minimum of 1/8 inch (3 mm) and expose coarse aggregate.

F. Remove residue on concrete surfaces.

Specifier Notes: Include the following paragraph when specifying Concrete-Top Supreme or Euco-Speed MP.

G. Remove loose rust and scaling on exposed reinforcement steel. Treat cleaned steel with anti-corrosion coating of Corr-Bond or Euco #452 LV Epoxy System. Apply coating in accordance with manufacturer's instructions.

Specifier Notes: Include the following three paragraphs when specifying Euco #456 Mortar.

H. Saw cut edges to 1/4 inch (6 mm) deeper than overlay thickness. Notch at edge of overlay.

I. Bring expansion joints up through overlay by saw cutting or with use of divider strips.

J. Prime prepared surfaces with Euco #456 Primer Sealer. Apply in accordance with manufacturer's instructions.

Specifier Notes: Include the following paragraph when specifying Thin-Top Supreme.

K. Prime prepared and dampened surfaces with bond coat of Thin-Top Supreme. Apply in accordance with manufacturer's instructions.

Specifier Notes: Include the following paragraph when specifying Concrete-Top Supreme.

L. Prime prepared and dampened surfaces with bond coat of Concrete-Top Supreme, bond coat of cement and SBR Latex, or epoxy bonding agent such as Corr-Bond or Euco #452 Epoxy System. Apply in accordance with manufacturer's instructions.

Specifier Notes: Include the following two paragraphs when specifying Euco-Speed MP.

M. Saw cut edges to 1/4 inch (6 mm) deeper than patch thickness. Notch at edge of repair.

N. Bring expansion joints up through repair by saw cutting or with divider strips.

O. Prime prepared and dampened surfaces with bond coat of Eucopatch or other suitable bonding agent. Apply in accordance with manufacturer's instructions.

Specifier Notes: Include the following two paragraphs when specifying VersaSpeed.

P. Mechanically prepare surface profile to minimum 1/8" (3mm). Precondition VersaSpeed to approximately 70 degrees F (21 degrees C) for 24 hours before using. A product scrub bond coat is required prior to product application. Apply VersaSpeed at temperature ranges of 40 to 85 degrees F(4 to 22 degrees C).

3.3 MIXING

A. Mix concrete repair mortar in accordance with manufacturer's instructions.

Specifier Notes: Include the following sentence when specifying Euco #456 Mortar, Thin-Top Supreme, or Eucopatch.

B. Ensure materials are between 60 degrees F (16 degrees C) and 90 degrees F (32 degrees C).

Specifier Notes: Include the following sentence when specifying Concrete-Top Supreme.

C. Ensure materials are between 40 degrees F (4 degrees C) and 100 degrees F (38 degrees C).

Specifier Notes: Include the following three paragraphs when specifying Euco-Speed MP.

D. Do not add sand or cement to mortar.

E. Extend mortar by adding dust-free, properly graded, hard, 3/8-inch (10-mm) pea gravel for patches deeper than 1 inch (25 mm). Do not extend mortar by adding limestone or aggregate containing limestone.

F. Maintain mixed and placed mortar at or below 140 degrees F (60 degrees C).

Specifier Notes: Include the following sentences when specifying VersaSpeed

G. The amount of water to be mixed with VersaSpeed is critical. Initially add 0.42 gal/54oz (1.6L/1597 ml) of water per 50 lb (22.7 kg) bag and mix for 2 minutes. If after the initial 2 minutes of mixing, the desired flow is not obtained, no more than 6 oz (177 ml) of additional water should be added to the mix in order to achieve more flow.

3.4 PLACEMENT

A. Place concrete repair mortar in accordance with manufacturer's instructions.

B. Place mortar immediately after mixing.

Specifier Notes: Include the following sentence when specifying Thin-Top Supreme, Concrete-Top Supreme, or Eucopatch.

C. Place mortar before bond coat has dried.

D. Place mortar at 1/8 inch (3 mm) to 2 inches (50 mm) in depth.

Specifier Notes: Include the following sentence when specifying Thin-Top Supreme.

E. Place mortar at 1/16 inch (2 mm) to 3/8 inch (10 mm) in depth.

Specifier Notes: Include the following sentence when specifying Concrete-Top Supreme.

F. Place mortar at 3/8 inch (10 mm) to 2 inches (50 mm) in depth.

Specifier Notes: Include the following three sentences when specifying Euco-Speed MP.

G. Place mortar at 1/2 inch (13 mm) to 8 inches (200 mm) in depth.

H. Do not featheredge.

I. Do not place over carbonated concrete.

Specifier Notes: Include the following sentence when specifying Eucopatch.

J. Place mortar at 1/16 inch (2 mm) to 6 inches (150 mm) in depth.

Specifier Notes: Include the following sentence when specifying Thin-Top Supreme or Concrete-Top Supreme.

K. Re-establish floor and slab joints when placing overlay.

Specifier Notes: Include the following sentence when specifying Euco-Speed MP.

L. Do not place mortar on ice-covered surface.

Specifier Notes: Include the following sentence when specifying VersaSpeed

M. Allow approximately 15 minutes to mix, place, and finish VersaSpeed repair mortar at 72 degrees F (22º degrees C).

3.5 FINISHING

Specifier Notes: Edit the following sentence to provide the desired finish.

A. Finish concrete repair mortar to match surrounding concrete.

Specifier Notes: Include the following paragraph when specifying Euco #456 Mortar, Thin-Top Supreme, Concrete-Top Supreme, or Eucopatch.

B. Do not add additional water to surface during finishing. Apply Eucobar in accordance with manufacturer's instructions if additional liquid is required.

Specifier Notes: Include the following sentence when specifying Euco-Speed MP.

C. Do not add additional water to surface during finishing.

Specifier Notes: Include the following sentence when specifying VersaSpeed

D. Do not add additional water to the surface during the finishing operation.

E. If applying a steel troweled finish, allow repaired area to stand undisturbed until initial set, after placement, before final finishing.

Specifier Notes: Include the following SEALING article when specifying Euco #456 Mortar and if sealing or topcoating with Euco #456 Primer, Sealer. Additional chemical resistance can be achieved by topcoating the Euco #456 Mortar with Eucothane.

3.6 SEALING

A. Seal or topcoat Euco #456 Mortar with [Euco #456 Primer, Sealer] [Eucothane]. Apply in accordance with manufacturer's instructions.

Specifier Notes: Include the following sentence when specifying VersaSpeed

B. VersaSpeed can be coated with epoxy systems within 4 hours at 70 degrees F (21 degrees C).

3.7 CURING

Specifier Notes: Include the following three paragraphs when specifying Thin-Top Supreme or Concrete-Top Supreme.

A. Cure concrete repair mortar in accordance with manufacturer's instructions.

B. Cure with high-solids curing compound of Super Aqua-Cure VOX or Super Diamond Clear VOX. Apply in accordance with manufacturer's instructions.

C. Do not use solvent-based curing compound.

Specifier Notes: Include the following sentence when specifying Thin-Top Supreme or Concrete-Top Supreme.

D. Cover mortar with polyethylene sheeting for a minimum of 3 days instead of applying curing compound, if desired.

Specifier Notes: Include the following sentence when specifying Euco-Speed MP.

E. Do not wet cure concrete repair mortar.

Specifier Notes: Include the following four paragraphs when specifying Eucopatch.

F. Cure concrete repair mortar in accordance with manufacturer's instructions.

G. Cure with high-solids curing compound of Super Aqua-Cure VOX, Super Rez-Seal, or Super Floor Coat. Apply in accordance with manufacturer's instructions.

H. Apply second coat of curing compound in hot, windy, or direct sunlight conditions.

I. Wet cure for a minimum of 3 days instead of applying curing compound, if desired.

Specifier Notes: Include the following sentence when specifying VersaSpeed

J. When an epoxy topcoat will NOT be applied, wet cure the surface with water and burlap or polyethylene sheets at least one day.

3.8 PROTECTION

Specifier Notes: Include the following sentence when specifying Thin-Top Supreme or Concrete-Top Supreme.

A. Protect placed concrete repair mortar from heavy traffic until material has cured.

Specifier Notes: Include the following sentence when specifying Concrete-Top Supreme or Eucopatch.

B. Protect placed concrete repair mortar from freezing until minimum compressive strength of 1,000 psi (7 MPa) is reached.

Specifier Notes: Include the following sentence when specifying Euco-Speed MP.

C. Protect placed concrete repair mortar from heavy traffic until minimum compressive strength of 2,000 psi (14 MPa) is reached.

D. Protect placed mortar from damage during construction.

END OF SECTION