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This Manu-Spec® utilizes the Construction Specifications Institute (CSI) *Project Resource Manual* (PRM), including *MasterFormat™*, *SectionFormat™* and *PageFormat™*. A Manu-Spec is a manufacturer specification using the proprietary method of specifying applicable to project specifications and master guide specifications. Optional text is indicated by brackets []; delete optional text in final copy of specification. Specifier notes precede specification text; delete notes in final copy of specification. Trade/brand names with appropriate product model numbers, styles and types are used in specifier notes and in the specification text article titled "Acceptable Material." Metric conversion, where used, is soft metric conversion.

This MANU-SPEC specifies synthetic gypsum cement based self-leveling liquid compound for filling, patching, smoothing and leveling substrates for interior applications.

SECTION 03 54 13 GYPSUM CEMENT UNDERLAYMENT

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes: This Section specifies synthetic gypsum cement based [fiber reinforced] self-leveling liquid compound for filling, patching, smoothing, and leveling substrates for interior applications.

Specifier Note: Revise paragraph below to suit project requirements. Add section numbers and titles per CSI MasterFormat and specifier's practice.

- B. Related Requirements:

Specifier Note: Include in this paragraph only those sections and documents that directly affect the work of this section. If a reader of this section could reasonably expect to find a product or component specified in this section, but it is actually specified elsewhere, then the related section number(s) should be listed in the subparagraph below. Do not include Division 00 documents or Division 01 sections, as it is assumed all technical sections are related to all project Division 00 documents and Division 01 sections to some degree. Refer to other documents with caution, as referencing them may cause them to be considered part of the contract.

1. Section [____].

1.2 REFERENCES

Specifier Note: Define terms unique to this section and not provided elsewhere in the contract documents. Include terms unique to the work result specified that may not be commonly known in the construction industry. Delete the following paragraph if no definitions are required.

- A. Definitions:
1. Friable: Substrate material easily crumbled or pulverized.

Specifier Note: List retained standard(s) referenced in this section alphabetically. Indicate issuing authority name, acronym, standard designation and title. Establish policy for indicating edition date of standard referenced and update as applicable.

V.02.2018

Contract Conditions Section 01 42 00 - References may be used to establish the edition date of standards. This paragraph does not require compliance with standard(s). It is a listing of all references used in this section. Only include here standards referenced in the body of the specification in PARTS 1, 2 and/or 3. Do not include references to building codes at any level.

B. Reference Standards:

1. American Concrete Institute (ACI).
 - a. ACI 117 Specification for Tolerances for Concrete Construction and Materials (ACI 117-10) and Commentary.
2. American National Standards Institute (ANSI).
 - a. ANSI/UL 723 Test for Surface Burning Characteristics of Building Materials.
 - b. ANSI/ASTM E136 Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750° C.
3. ASTM International (ASTM).
 - a. ASTM C109/C109M Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2 in. or [50 mm] Cube Specimens).
 - b. ASTM C136/C136M Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - c. ASTM C191 Standard Test Method for Time of Setting of Hydraulic Cement by Vicat Needle.
 - d. ASTM C348 Standard Test Method for Flexural Strength of Hydraulic-Cement Mortars.
 - e. ASTM C1583/C1583M Standard Test Method for Tensile Strength of Concrete Surfaces and the Bond Strength or Tensile Strength of Concrete Repair and Overlay Materials by Direct Tension (Pull-off Method).
 - f. ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials.
 - g. ASTM E136 Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750° C.
 - h. ASTM E1155 Standard Test Method for Determining FF Floor Flatness and FL Floor Levelness Numbers.
4. South Coast Air Quality Management District (SCAQMD).
 - a. SCAQMD Rule 1113 Architectural Coatings.
5. Underwriters Laboratories, Inc. (UL).
 - a. ANSI/UL 723 Test for Surface Burning Characteristics of Building Materials.
6. US Green Building Council (USGBC).
 - a. LEED Version 4 (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package For New Construction and Major Renovations.

Specifier Note: Article below includes submittal of relevant data to be furnished by Contractor before, during or after construction. Coordinate this article with Architect's and Contractor's duties and responsibilities in Contract Conditions and Section 01 33 00 - Submittal Procedures.

1.3 SUBMITTALS

- A. Product Data:** (manufacturer's standard specifications and descriptive literature, including:
1. Product characteristics.
 2. Performance criteria.
 3. Safety Data Sheets (SDS).

Specifier Note: Specify submittals intended to document manufacturer storage, installation and other instructions.

- B. Manufacturer's written instructions,** including:
1. Delivery, storage and handling recommendations.
 2. Preparation and application recommendations.
- C. Test Reports:** Certified test reports showing compliance with specified performance characteristics and physical properties.
- D. Certificates:** Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- E. Manufacturer's Field Reports:** Submit manufacturer's field reports within 3 days of each manufacturer representative's site visit and inspection.

Specifier Note: Coordinate article below with Contract Conditions and with Section 01 78 36 - Warranties.

- F. Installer's Experience: Installers will be experienced in performing work of this section and specialized in work similar to that required for this project; INSTALL certified or equal.
- G. Warranty: Fully executed, issued in [Owner's] name, and registered with manufacturer, including:
 - 1. Manufacturer's 10-year warranty, from date of substantial completion, covering defects in materials.

Specifier Note: Retain the following only if specifying for a LEED project. Specify only the technical submittal requirements necessary to achieve the credits desired for this project. For Schönox AP, Schönox APF and Schönox AST, the possible total for LEED v4 is 8.

- H. Sustainable Design (LEED) Submittals:
 - 1. LEED Submittals: In accordance with Section [01 35 21 – LEED Requirements].
 - 2. Submit verification for items when appropriate as follows:
 - a. EQc2 - Low-Emitting Materials: 3.
 - b. MRc1 - Building Reuse — Maintain Existing Walls, Floors and Roof: 2.
 - c. MRc2 - Construction Waste Management: 1.
 - d. MRc3 - Materials Reuse: 1.
 - e. MRc4 - Recycled Content: 1.

1.4 QUALITY ASSURANCE

- A. Installer: Experienced in performing work similar to work of this section.

1.5 DELIVERY, STORAGE & HANDLING

- A. Deliver materials in accordance with manufacturer's written instructions.
 - 1. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact and product name and manufacturer clearly visible and sized to suit project.
- B. Store materials protected from exposure to harmful environmental conditions, clean, dry, frost-free and at recommended temperature and humidity levels.
 - 1. Do not store materials at temperatures lower than 41 degrees F or higher than 90 degrees F.

1.6 EXISTING CONDITIONS

- A. Apply self-leveling underlayment only when substrate temperature is greater than 41 degrees F and lower than 90 degrees F.

1.7 WARRANTY

- A. Manufacturer's 10-year Warranty: Manufacturer's standard comprehensive warranty document executed by authorized company official.
 - 1. Project Warranty: Submit request for Owner's acceptance is in addition to and not intended to limit other rights Owner may have under Contract Conditions of manufacturer's standard comprehensive warranty document.

PART 2 PRODUCTS

Specifier Note: Add product attributes performance characteristics, material standards and descriptions in other articles as applicable. Use of such phrases as "or equal," "approved equal" or similar phrases may cause ambiguity in specifications. Such phrases require verification (procedural, legal and regulatory) and assignment of responsibility for determining "or equal" products.

2.1 MANUFACTURER

- A. Schönox, HPS North America, Inc.; 511 Wilhite Street, Florence, AL 35630; Phone: (855) 391-2649, (256) 246-0345; Fax: (256) 246-0346; Email: info@hpsubfloors.com; Website: www.hpsubfloors.com.

2.2 PERFORMANCE REQUIREMENTS

Specifier Note: Retain and edit the following paragraph related to compressive strength and choose 3600 psi if specifying Schönox AST; choose 5800 psi if specifying Schönox AP; choose 6200 psi if specifying Schönox APF.

- A. Compressive Strength: To ASTM C109, [3600] [5800] [6200] psi at 28 days.

Specifier Note: Retain and edit the following paragraph related to flexural strength, and choose 1250 psi if specifying Schönox AST; choose 1400 psi if specifying Schönox AP; choose 1600 psi if specifying Schönox APF.

- B. Flexural Strength: To ASTM C348, [1250] [1400] [1600] psi at 28 days.

Specifier Note: Retain and edit the following paragraph related to tensile strength, and choose 400 psi for Schönox AP or Schönox APF. Tensile strength is not applicable to Schönox AST. Delete the following paragraph if specifying Schönox AST.

- C. Tensile Strength: To ASTM C1583, 400 psi after 3 days.

Specifier Note: Delete the following paragraph if specifying Schönox AST. Schönox AST is a fast drying, smoothing and patching compound, and set times are negligible.

- D. Setting Time to ASTM C191:

Specifier Note: Retain and edit the following paragraph related to initial set times and choose 160 minutes if specifying Schönox AP; choose 170 minutes if specifying Schönox APF.

1. Initial Set: approximately [160] [170] minutes at 70 degrees F.

Specifier Note: Retain and edit the following paragraph related to final set times for both Schönox AP and Schönox APF.

2. Final Set: approximately 200 minutes at 70 degrees F.

Specifier Note: Retain and edit the following paragraph to designate timing for foot traffic; choose 1 hour if specifying Schönox AST; choose 2 hours if specifying Schönox AP; choose 3 hours if specifying Schönox APF.

3. Foot-traffic Ready: [1] [2] [3] hours minimum.

Specifier Note: Retain and edit the following paragraph related to when product is able to be covered by other materials. Schönox AST can be covered after 30 minutes when applied as a true featheredge and after 12 hours when covering larger areas. Choose 16 hours if specifying either Schönox AP or Schönox APF.

- E. Covering Time: [30 minutes] [[12] [16] hours] minimum with up to 1/8 inch layer thickness.

- F. VOC: 0 g/l to SCAQMD Rule 1113.

- G. Fire Burning Characteristics:

1. UL Certified
 - a. ANSI/UL 723.
 - b. ANSI/ASTM E136.
2. ASTM E84
 - a. Flame spread: 0.
 - b. Smoke developed: 0.

- H. Floor Flatness: To ASTM E1155, in accordance with ACI 117.

2.3 DESCRIPTION

Specifier Note: Retain and edit the following Paragraph. Choose the option for fiber reinforced if specifying Schönox APF only.

- A. Synthetic gypsum cement based [fiber reinforced] self-leveling liquid compound for filling, patching, smoothing and leveling substrates in interior applications.

2.4 MATERIALS

- A. Underlayment system: Synthetic gypsum cement based self-leveling, low VOC underlayment [capable of permitting feathered edges].

Specifier Note: Retain and edit the following Paragraph to suit project requirements. Choose the first option when specifying Schönox AST. Choose the second option when specifying either Schönox AP or Schönox APF. Contact the manufacturer directly to determine coverage for underlayment thicknesses other than the options specified below.

1. Coverage: [[75] square feet per 10 lbs bag when applied as true featheredge] [60 - 70 square feet per 55 lbs bag at 1/8 inch thickness].

Specifier Note: Retain and edit the following Paragraph to specify layer thickness. Schönox AST can be applied as layer thickness above a featheredge to 1/4 inch. Schönox AP without aggregates can be applied in thicknesses of 1/6 to 1 inch and can be applied up to 2 inches thick with aggregates added to the mix.

2. Layer thickness [with] [without] aggregates: [[1/4] [_____] inches] [As indicated].

Specifier Note: Retain and edit the following Paragraph to suit project requirements. Specify Schönox AST for featheredge work or for smaller patch and repair work. Specify Schönox AP for underlayment work to 2 inches thick. Specify Schönox APF under critical substrates for refurbishment and when fiber reinforcement is to be used instead of laying reinforcement fabric.

3. Acceptable Material: [Schönox AST] [Schönox AP] [Schönox APF].
- B. Primer: In accordance with manufacturer's written recommendations.

Specifier Note: Retain and edit the following Paragraph to suit substrate conditions. Choose Schönox VD (1.3) for standard absorbent concrete or cement substrates. Choose Schönox SHP for non-absorbent smooth, sound substrates such as ceramic tile. If substrate has been sanded and then vacuumed choose Schönox KH FX. Contact the manufacturer directly for more information on application usage.

1. Acceptable Material: [Schönox VD (1.3)] [Schönox SHP] [Schönox EPA] [Schönox KH FX].

2.5 ACCESSORIES

- A. Reinforcing Mat: Multiaxial glass fiber fabric.
1. Acceptable material: Schönox Renotex.
- B. Repair Compound: In accordance with manufacturer's written recommendations.
1. Acceptable Material: Schönox Repair Compound.
- C. Residual Moisture Mitigation: Moisture suppressor in accordance with manufacturer's written recommendations.

Specifier Note: Retain and edit the following Paragraph to suit substrate conditions. Contact the manufacturer directly to determine the most effect residual moisture suppressor for the project substrate conditions.

1. Acceptable Material: [Schönox SDG] [Schönox MR 18] [Schönox EPA].
- D. Sand: Fine sand aggregate to ASTM C136/C136M.

PART 3 EXECUTION

3.1 INSTALLER

- A. Use only installers who have training and experience in performing work of this section and specialized in work like that required for this project; INSTALL certified or equal.

3.2 EXAMINATION

- A. Verification of Conditions: Verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for underlayment application in accordance with manufacturer's written recommendations.
1. Ensure substrate is smooth, sound, clean and free of contaminants which may hinder adhesion.
 2. Visually inspect substrate in presence of Architect or General Contractor.
 3. Inform Architect or General Contractor of unacceptable conditions immediately upon discovery.

4. Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Architect or General Contractor.
5. Starting application of synthetic gypsum cement underlayment implies substrate conditions are acceptable for Work of this Section.

Specifier Note: Retain and edit the following article to meet project requirements. Retain only those paragraphs appropriate to the project.

3.3 PREPARATION

- A. Mechanically remove friable substrate materials and repair areas to smooth finish using repair compound and methods in accordance with manufacturer's written recommendations.

Specifier Note: Retain and edit the following Paragraph to suit substrate conditions only if moisture is an issue.

- B. Mitigate moisture using residual moisture suppressor and methods in accordance with manufacturer's written recommendations.

Specifier Note: A reinforcing mat is not always required. The following Paragraph should be retained or deleted to meet specific project requirements. Contact the manufacturer directly for advice on the use of a reinforcing mat. Schönox APF is a fiber reinforced underlayment and does not require a separate reinforcing mat. Delete the following Paragraph if Schönox APF is specified.

- C. Lay reinforcing mat in accordance with manufacturer's written recommendations.

3.4 MIXING

Specifier Note: Retain and edit the following Paragraph to suit product specified. For Schönox AST choose 10 lbs bag with 1.2 quarts of water or 33 lbs bag with 4 quarts of water; for Schönox AP choose 55 lbs bag with 6.3 quarts of water; for Schönox APF choose 55 lbs bag with 5.8 quarts of water.

- A. Mix each [10] [33] [55] lb bag with [1.2] [4] [6.3] [5.8] quarts of cold clean water.
 - a. Do not overwater.

Specifier Note: Delete the following Paragraph if aggregates are not required.

- b. Add aggregates in accordance with manufacturer's written recommendations.
- c. Mix thoroughly for 3 minutes minimum using heavy duty drill mixer.

Specifier Note: Choose 20 minutes for Schönox AST and 30 minutes for either Schönox AP or Schönox APF.

- d. Use mixture within [20] [30] minutes of mixing.

3.5 APPLICATION

Specifier Note: Specifier Note: There is no primer required when using Schönox AST. Delete the following paragraph if Schönox AST is specified.

- A. Prime substrate in accordance with manufacturer's written recommendations.
- B. Pour self-leveling underlayment onto substrate and spread using smoothing trowel.

Specifier Note: Retain and edit the following Paragraph only if a second layer is required to achieve a thicker underlayment. Delete the following paragraph if a single layer will provide adequate underlayment coverage.

- C. Prime first layer only after it has reached final set and only when second layer is required.
 1. Use primer and methods in accordance with manufacturer's written recommendations.
 2. Pour second layer over primed first layer and spread using smoothing trowel.
 3. Ensure second layer does not exceed thickness of first layer.

Specifier Note: Retain and edit the following Paragraph to suit project conditions. A spike roller is recommended for greater thickness pours.

- D. Ensure surfaces are even and level using [pin leveler] [spike roller].

Specifier Note: Retain and edit the following Paragraph only when underlayment will be used as a wear layer over existing substrate.

3.6 FIELD QUALITY CONTROL

- A. Field Inspection: Coordinate field inspection in accordance with Section [01 45 00 - Quality Control].

Specifier Note: Specify requirements if manufacturers are to provide field quality control with onsite personnel for instruction or supervision of product installation, application, erection, or construction. Manufacturer field reports are included under PART 1, Submittals.

- B. Manufacturer's Services:

Specifier Note: Use the following Paragraphs only when manufacturer's field services are provided and are required to verify the quality of the installed components. Establish the number and duration of periodic site visits required by manufacturer and specify below. Contact the manufacturer to determine any costs associated with Technical Representatives providing manufacturer's field services. Delete if field services are not required.

- 1. Coordinate manufacturer's services with Section [01 45 00 - Quality Control].

Specifier Note: Delete the following paragraph if no costs are associated with manufacturer's services.

- 2. Arrange for payment for manufacturer's services.
- 3. Have manufacturer review work involved in handling, application, protection, and cleaning of synthetic gypsum cement underlayment and submit written reports in acceptable format to verify compliance of Work with Contract conditions.
- 4. Manufacturer's Field Services: Provide manufacturer's field services consisting of product use recommendations and periodic site visits for product installation review in accordance with manufacturer's instructions.
 - a. Report any inconsistencies from manufacturer's recommendations immediately to Architect or General Contractor.

Specifier Note: Edit the following Paragraph to meet project requirements. Coordinate site visits with manufacturer or delete the Paragraph and all of its subparagraphs if site visits are not required.

- 5. Schedule site visits to review work at stages listed:
 - a. After delivery and storage of synthetic gypsum cement underlayment, and when preparatory work on which Work of this Section depends is complete, but before application begins.
 - b. During progress of work.
 - c. Upon completion of Work, after cleaning is carried out.
 - d. Obtain reports within three days of review and submit immediately to Architect or General Contractor.

3.7 CLEANING

- A. Immediately clean tools in water.
 - 1. Leave work area clean at end of each day.
- B. Upon completion, remove surplus materials, rubbish, tools and equipment.
- C. Collect recyclable waste and dispose of at appropriate recycling facilities.

Specifier Note: Specify protection methods completed after installation, but prior to acceptance by the owner. Include only statements unique to this Section. Coordinate the following Article with Section 01 76 00 - Protecting Installed Construction.

3.8 PROTECTION

- A. Protect applied synthetic gypsum cement underlayment from damage during construction.

1. Place temporary wood planking over finished synthetic gypsum cement underlayment work as directed by Architect or General Contractor.
- B. Repair or replace adjacent materials damaged by application of synthetic gypsum cement underlayment.

END OF SECTION