PENNCHEM™ 97 MEMBRANE INSTALLATION SPECIFICATION

1. SCOPE

1.1 This specification governs the installation of PENNCHEM 97 Membrane as manufactured by ErgonArmor for application on concrete and steel substrates.

1.2 This specification shall be used in conjunction with information presented on product data sheets CE-293 Pennchem 97 Membrane, CE-139 PENNTROWEL™ Epoxy Primer, Novocoat™ SC-1100 and CE-314 PENNGUARD™ HP Primer and any associated specifications referenced therein.

2. MATERIAL, ENVIRONMENTAL, AND SUBSTRATE CONDITIONS

2.1 The product and substrate temperatures are important. In cooler temperatures, the product storage and construction areas shall be heated to achieve and maintain the temperatures outlined below.

2.2 At the time of mixing and application the temperature of the components should ideally be between 70°F (21°C) and 90°F (32°C).

2.3 The temperature of the prepared substrate shall be at least 5°F (3°C) above the moisture dew point and between 50°F (10°C) and 95°F (35°C) at the time the Pennchem 97 Membrane is applied.

2.4 Freshly installed Pennchem 97 Membrane must be protected from moisture until it has cured to the dry-to-touch stage.

3. SURFACE EVALUATION

3.1 The condition of new and existing concrete surfaces can vary greatly. The surface should be thoroughly inspected to evaluate the condition and verify suitability to accept the Pennchem 97 Membrane. The assessment and evaluation of the suitability of the surface should precede quotations, procurement, or mobilization of installation crews.

3.2 When forms will or have been used for placing concrete they should be designed to yield a smooth continuous surface to which the lining will be applied.

3.3 New concrete shall reach a minimum compressive strength of 3000 psi (20 MPa) and a surface tensile strength of 300 PSI (2.0 MPa) before the lining is applied.

3.4 All cavities, stone pockets, honeycombing, and bug holes greater than 1/4" (6 mm) depth shall be filled by repairing with appropriate polymer-modified cementitious materials.

4. SUBSTRATE PREPARATION ON CONCRETE

4.1 A single pass troweled finish shall be given to new concrete floors with care being taken to avoid bringing laitance to the surface. New concrete shall be cured in accordance with good practice as outlined in ACI-308 "Recommended Practice for Curing Concrete". Do not use liquid curing compounds as they may impede the bond of the lining system.

4.2 A concrete surface to which Pennchem 97 Membrane is to be applied shall be prepared by abrading the concrete to achieve the texture of a medium (80-120 grit) sandpaper. The surface shall have a non-glazed appearance. Remove enough material to achieve a sound concrete surface free of laitance, glaze, efflorescence, and concrete curing and form release agents.

4.3 Consult SSPC-SP 13/NACE No. 6 for recommended surface preparation procedures.

4.4 Remove all form marks and protrusions such as prominent aggregate exposure. Tie wires, reinforcing wires must be cut off below the surface and make the surface flush by packing with a suitable fast curing sand/cement repair mix. All cavities, stone pockets, honeycombing, and bug holes shall also be filled.

5. SUBSTRATE PREPARATION ON STEEL

5.1 Prepare steel in accordance with SSPC-SP 10 or SA 2.5. Primer is not required on steel but the use of PENNGUARD™ HP Epoxy Primer is suggested to minimize re-rusting of freshly blasted substrates.

6. PRIMER APPLICATION

6.1 PENNTROWEL™ Epoxy Primer (CE-139) or Novocoat SC1100 are the recommended primers for all concrete surfaces. It seals the substrate surface and promotes adhesion of Pennchem 97 Membrane. Consult Product Data Sheet CE-139 and Installation Specification CES-342 for complete product details.

6.2 Pennguard HP Primer (CE-314) can be used as a primer on freshly prepared steel substrates to prevent re-rusting of freshly blasted surfaces. Consult Installation Specification CES-150 for complete installation details of Pennguard HP Primer.

7. MIXING PENNCHEM 97 MEMBRANE

7.1 Remove the lid from the Pennchem 97 Membrane pail. Inspect for damage incurred during transit.

7.2 Ensure that there are no leaks in the Part B Hardener container, there is no water present on or in the Part A Base component and the pail is free of dents in the side wall that may inhibit the mix blade’s access to the bottom corners of the pail.

7.3 To mix Pennchem 97 Membrane, use a heavy-duty variable speed drill with a 3/4" (16-18 mm) chuck and sufficient torque to deliver a consistent speed under load. Fit drill with a Jiffler mix

blade, Model DC312, with 2 x 6.5" (165 mm) propeller blades. Use of any other equipment to mix Pennchem 97 Membrane requires prior written approval from ErgonArmor as incomplete mixing can prevent full cure and severely compromise system performance.

7.4 Using drill mixer and mix blade specified above, pre-mix Part A by itself for a minimum of one minute. If temperatures are below 65°F (18°C) mix Part A for a minimum of 90 seconds.

7.5 A good manual mixing technique involves movement of the rotating blade within the pail. Move the blade around the base of the pail in a circular motion. Simultaneously lift the blade from the base of the pail without bringing the blade above the surface of the compound and continue the circular motion around the side of the pail. During mixing, hold the mix blade occasionally at a 30-degree angle within the mixture, to ensure all contents of the pail are thoroughly mixed. Pay close attention to contact all surfaces of the sides of the pail with the mix blade. Make sure to mix in the corner of the pail.

7.6 Open Part B Hardener. While continuing to mix Part A Base component, take a full 15 to 20 seconds to slowly pour Part B into the vortex created by the mix blade in Part A.

7.7 When the material temperature is 65°F (18°C) or higher, mix for at least three (3) minutes using a good mixing technique to yield a uniform mix. When the temperature of the components is 50°F (10°C) to 60°F (15°C) mix for at least four (4) minutes using a good mixing technique to yield a uniform mix. Use a timer to prevent under mixing.

7.8 Pennchem 97 Membrane can be used immediately after mixing. Work life is 45-60 minutes at 70°F (21°C). Initial set of 5-6 hours can be expected.

7.9 Protect membrane components and mixed material from any contact with moisture or other contaminants.

8. INSTALLATION OF PENNCHEM 97 MEMBRANE

8.1 It is considered good practice to install Pennchem 97 Membrane in two passes. This minimizes the potential for pinholes which are unacceptable for a chemical-resistant membrane.

8.2 Apply Pennchem 97 Membrane with a flat trowel to a uniform thickness as per the project specification. Typical application thickness is 0.125" (3.0 mm) but can vary depending on project objectives. Trowel a minimum 1/16" (1.5 mm) thickness of Pennchem 97 Membrane per coat onto the substrate with a suitable flat trowel.

8.3 Subsequent layers of Pennchem 97 Membrane must be applied before the previous layer becomes tack-free. If the previous layer cures to a tack-free state it must be lightly abraded to promote adhesion of subsequent coats. Stage the work area so the applied adhesive remains tacky enough to transfer wet product residue to a gloved finger when touched. Apply over the

previously applied layer to continue installing Pennchem 97 Membrane to full thickness. If it has cured beyond this stage and transfers no residue to a glove when touched, abrade the surface to remove the surface gloss. This procedure is critical since wet adhesive will not bond well to cured adhesive. It is better to allow the Membrane to dry for a longer period, as it is difficult to sand freshly dried membrane. Stage workflow layout accordingly.

8.4 When a work stoppage is anticipated, remove wet Pennchem 97 Membrane down to concrete three to four inches back from the leading edge of the completed lining. Should the time between a work stoppage and restart exceed 48 hours, use a mechanical grinder or wire brush to remove excess adhesive and de-gloss cured adhesive residue. A darkened concrete residue is acceptable on the leading edge.

8.5 For vertical surfaces it is often not possible to apply Membrane to a thickness greater than 0.060" (1.5 mm) per pass before slumping may occur. Apply material in multiple coats to achieve specified thickness, paying attention to intercoat adhesion techniques noted earlier.

9. CURING OF LINING

9.1 Cure of the applied Membrane is affected by air and substrate surface temperature, relative humidity, amount of sunlight and rain. In general, the membrane lining can be put into service when dry to touch. Membrane dry-to-touch cure schedule for foot traffic conditions is 48 hours at 60˚F (16˚C), 24 hours at 70˚F (22˚C), and 12 hours at 90˚F (32˚C). Relative humidity is assumed to be 50%. For foot traffic, Membrane must be tack-free.

9.2 If job scheduling requires getting on the lining sooner (for example, to apply a subsequent polymer concrete or acid brick layer), it is permitted to dust the surface lightly to prevent workers boots sticking to the tacky lining as they walk on it. Use common sense and good judgement to determine if the lining has not achieved sufficient cure to proceed without damaging the lining. This technique is not meant to proceed onto a still wet lining.

10. CLEANUP

10.1 Clean tools with mineral spirits and rags. Dispose of rags in accordance with good practice and in compliance with local regulations.

11. INSPECTION TESTING AND RECORDKEEPING

11.1 It is good practice to record certain variables when performing industrial lining work.

11.2 An initial 100 sq. ft. (10 sm) representative area shall be prepared and then deemed as an acceptable work standard by all parties. This area shall establish the standard for the remaining work.

11.3 A suggested starting point for recordkeeping is as follows: Record the ambient air and material temperature in the mixing and work area every two hours. Mixing time (both A and B components) as outlined earlier and application and curing temperatures should be noted. Use the Cure Verification Cards provided inside the Pennchem 97 Membrane kit and check them for full cure the next day. The moisture dew point can also be measured and recorded every two

hours of the working period during application. Third party inspectors may establish further recordkeeping guidelines.

12. REMEDIAL WORK AND REPAIRS

12.1 Despite best efforts it is occasionally necessary to perform remedial work on the lining. The lining can be damaged by other trades or applications or mixing mistakes may be discovered that do not yield a satisfactory result. Due to the nature of the nonconformance, repair procedures can take different specific forms. In general, the installation procedure outlined earlier can be followed.

12.2 Cut out the nonconforming membrane and scrape down to the primed concrete surface.

12.3 To marry the new membrane repair to old, wire brush or abrade the existing primed concrete surface as well as an area of the existing sound lining extending 2" (50 mm) around the area to be repaired. Re-apply the membrane in accordance with specifications above.

13. SAFETY PRECAUTIONS DISCLAIMER CONTACT INFORMATION

13.1 Consult current Safety Data Sheets (SDS's) before commencement of work.

13.2 While statements, technical information and recommendations contained herein are based on information our company believes to be reliable, nothing contained herein shall constitute any warranty, express or implied, with respect to the products and/or services described herein, and any such warranties are expressly disclaimed. We recommend that the prospective purchaser or user independently determine the suitability of our product(s) for their intended use. No statement, information, or recommendation with respect to our products, whether contained herein or otherwise communicated, shall be legally binding upon us unless expressly set forth in a written agreement between us and the purchaser/user. For all Terms and Conditions of Sale see https://www.ergonarmor.com/about-ergon-inc/terms-and-conditions.

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