



PENNTROWEL™ L/F LINING SYSTEMS INSTALLATION SPECIFICATION

1. SCOPE

- 1.1 This specification governs the installation of Penntrowel Epoxy L/F Lining System, Penntrowel Vinyl Ester L/F Lining System and Penntrowel Novolac L/F Lining System as manufactured by Armor. It shall be used in conjunction with information presented on product data sheets CE-243 Penntrowel Vinyl Ester L/F Lining System, CE-245 Penntrowel Epoxy L/F Lining System, CE-279 Penntrowel Novolac L/F Lining System, CE-139 Penntrowel Epoxy Primer, Novocoat™ SC1100 Primer, CE-138 Penntrowel Vinyl Ester Primer, and any associated specifications referenced therein.

2. MATERIAL, ENVIRONMENTAL, AND SUBSTRATE CONDITIONS

- 2.1 The product and substrate temperatures are important. The product storage and construction areas shall be conditioned to achieve and maintain the temperatures outlined below.
- 2.2 At the time of mixing and application, the temperature of the components and substrate should ideally be 70°F (21°C) and in all cases between 50°F (10°C) and 90°F (32°C).
- 2.3 The temperature of the prepared surface shall be at least 5°F (3°C) above the moisture dew point and between 50°F (10°C) and 90°F (32°C) at the time the materials are applied.
- 2.4 Optional Cold Room Hardeners are available. Consult Armor for applications where temperatures will be between 35°F (2°C) and 50°F (10°C).
- 2.5 The work site must be protected from precipitation until the lining has achieved dry-to-touch stage and is not damaged by light traffic.

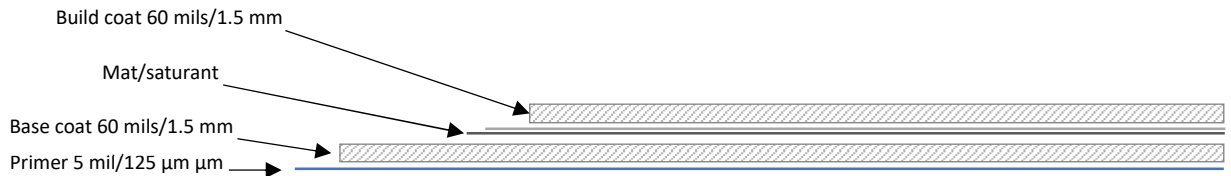
3. SURFACE PREPARATION

- 3.1 All L/F Systems can be applied onto a concrete or carbon steel substrate. Consult Armor for other substrates.
- 3.2 The surface condition of new and/or existing concrete can vary greatly. The surface should be thoroughly inspected to identify the condition and suitability of the surface to accept the lining. An assessment and evaluation of the suitability of the surface should precede quotations, procurement, or mobilization of installation crews.
- 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. Remove all form marks and protrusions such as prominent aggregate exposure, tie wires, reinforcing wires. They must be cut off below the surface and covered.

- 3.5 A concrete surface to which the Lining is to be applied shall be prepared by abrading the concrete and have a resultant surface like a medium grit of sandpaper. The surface shall have a non-glazed appearance. Remove enough material to achieve a sound concrete surface free of laitance, glaze, efflorescence and incompatible concrete curing agents or form release agents.
- 3.6 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.
- 3.7 Consult SSPC-SP 13/NACE No. 6 for detailed recommended surface preparation procedures on concrete.
- 3.8 For steel substrates refer to SSPC-SP#5. A 3-mil (75 µm) profile is recommended.

4. SYSTEM LAYERS

- 4.1 All 3 of the Armor L/F Lining Systems are constructed using the following layers. Only the resins used with the various systems are different.



- 4.2 Consult packaging and mix ratio instructions on the applicable tds.
- 5. PRIMER FOR CE-245 PENNTROWEL Epoxy L/F AND CE-279 PENNTROWEL Novolac L/F**
- 5.1 Penntrowel Epoxy Primer (CE-139) or Novocoat SC 1100 are the recommended primers when applying CE-245 Penntrowel Epoxy L/F Lining System and CE-279 Penntrowel Novolac L/F Lining System onto concrete. Primer seals the substrate surface, promotes adhesion of the Lining System and minimizes concrete outgassing. Consult Product Data Sheets for additional details.
 - 5.2 Open proportioned cans of Part A Primer Resin and Part B Primer Hardener. Blend thoroughly together in mixing vessel. Use a slow speed electric drill to mix the liquids to avoid whipping air into the mix.
 - 5.3 Mix thoroughly for one minute minimum and until mix is homogeneous.
 - 5.4 Apply mixed primer onto prepared substrate by use of roller or brush. On damp concrete surfaces the primer can be scrubbed into the surface with a stiff brush. This will emulsify any residual wetness at the concrete surface and penetrate the concrete. The presence of residual moisture will be observed if present as the primer will turn a milky-white color.
 - 5.5 Allow primer to dry to touch before proceeding with application of lining. Primer must remain clean and dry before proceeding with Surfacer application
- 5.6 PRIMER APPLICATION CE-243 PENNTROWEL Vinyl Ester L/F Lining System**
- 5.7 Penntrowel Vinyl Ester Primer (CE-138) is the recommended primer when applying CE-243 Penntrowel Vinyl Ester L/F Lining System. It is not tolerant of wet or damp surfaces. All substrates are to be completely dried before proceeding.

Penntrowel Vinyl Ester Primer does not come packaged with pre-proportioned matching package sizes. It requires careful measuring of CHP Hardener to add to the Vinyl Ester Primer Resin. Consult Product Data Sheet CE-138 for additional details including mix ratio instructions.

- 5.8 Follow detailed instructions for applying CE-138 Penntrowel Vinyl Ester Primer after mixing as outlined in sections above. While the Resins are different, the primer application instructions are the same.

6. BASECOAT AND BUILDCOAT - MIXING

- 6.1 Remove the lid from the Part A Resin and pour into mixing vessel. The mixer can be a KOL-type rotary mixer or equivalent.
- 6.2 Slowly add contents of Part B Hardener into the Part A Resin and mix thoroughly for at least one minute or until mix is homogeneous.
- 6.3 Slowly add proportioned L/F Filler into mixed Resin/Hardener and mix thoroughly for at least one minute and until there are no visible dry spots in the Filler. Consult data sheet for exact mix ratios and proportions.
- 6.4 Never add water, Portland cement additives, or other adulterants to the mix.

7. MIXED BASECOAT AND BUILDCOAT LAYERS - INSTALLATION

- 7.1 L/F Lining Systems are applied in layers to achieve a total lining thickness of a nominal 1/8"-3/16" (3.0-4.5 mm) inclusive of all layers as illustrated in section 4.1. Follow component mix ratio instructions as outlined on the product data sheet.
- 7.2 A steel trowel is the preferred tool to install and finish the surface of L/F base and build coat layers. Trowel the base and build layers to a nominal 60 mil (1.5 mm) thickness each.
- 7.3 L/F Systems base and build coat layers will exhibit a work life of 45-60 minutes at 70°F (21°C). After application of basecoat, consult section 7.6 for mat and saturant layer installation.
- 7.4 There is no need to topcoat the build coat with a finish coating. A light application of Finishing Solution (product code 19512) may be used for the Vinyl Ester L/F System to help smooth the surface. Use a short nap roller lightly dampened with Finishing Solution for this purpose.

7.5 SATURANT LAYER

- 7.6 Apply glass mat immediately onto the wet base coat layer surface. Use a serrated roller to smooth and embed the glass mat. Abut cloth layer edges together, leaving no gaps. Once smoothed, flood the cloth with a saturating layer of mixed resin:hardener to ensure full wetting of the cloth. Use serrated roller to smooth out the cloth and saturant. Proceed with subsequent build layer once saturant/cloth layer is dry to touch.

8. CLEANUP

- 8.1 Clean tools with xylene and rags. Dispose of rags in accordance with good practice and in compliance with local regulations.

9. SAFETY PRECAUTIONS DISCLAIMER CONTACT INFORMATION

- 9.1 Consult current Safety Data Sheets (SDS's) before commencement of work.
- 9.2 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

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