# *INSTALLATION SPECIFICATION TUFCHEM™ II MEMBRANE SPRAY GRADE*

## *1. SCOPE*

1.1 This specification governs the installation of Tufchem II Membrane Spray Grade as manufactured by Armor.

1.1 This specification shall be used in conjunction with information presented on product data sheets CE-228 Tufchem II Membrane Spray Grade, CE-139 Penntrowel™ Epoxy Primer, Novocoat™ SC1100 Primer and CE-150 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 conditioned 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 surface 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 Tufchem II Membrane Spray Grade is applied.

2.4 The work site must be protected from precipitation until the membrane has achieved dry to touch stage.

## *3. SURFACE PREPARATION*

3.1 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 Tufchem II Membrane Spray Grade. An assessment and evaluation of the suitability of the surface should precede quotations, procurement, or mobilization of installation crews.

3.2 When forms have been used for placing concrete, they should be designed to yield a smooth continuous concrete 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 concrete surface to which the Tufchem II Membrane Spray Grade 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.

4.2 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.

4.3 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. They must be cut off below the surface and filled 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 or Novocoat SC 1100 are the recommended primers for all concrete surfaces. Primer seals the substrate surface and promotes adhesion of Tufchem II Membrane Spray Grade. Consult Product Data Sheet CE-139 and Installation Specification CES-342 for complete product details.

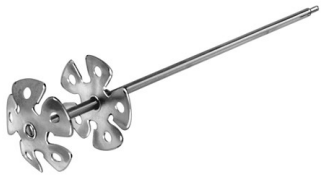
6.2 Pennguard HP Primer (CE-314) can be used as a primer on freshly prepared steel substrates to prevent re-rusting of freshly blasted surfaces. Consult Installation Specification CES-150 for complete installation details of Pennguard HP Primer.

## *7. MIXING TUFCHEM II MEMBRANE SPRAY GRADE*

7.1 Remove the lid from the Tufchem II Membrane Spray Grade 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 mixing blade contact to the bottom corners of the pail.

7.3 To mix Tufchem II Membrane Spray Grade, use a heavy-duty variable speed drill with a 3/4" (19 mm) chuck and sufficient torque when 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 Tufchem II Membrane Spray Grade requires prior written approval from Armor, 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) first 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 pail with the mixing blade. Make sure to mix in the corner of the pail.

7.6 Shake Part B Hardener and listen for a free-flowing liquid sound. 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 mixing blade in Part A. If Hardener is not water-thin, call Armor.

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 mixture. 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 Tufchem II Membrane Spray Grade is ready for use immediately after mixing. If left undisturbed after mixing, it will thicken over time.

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

## *8. INSTALLATION OF TUFCHEM II MEMBRANE SPRAY GRADE*

8.1 It is considered good practice to install Tufchem II Membrane Spray Grade in 2 passes. This minimizes the potential for pinholes which are unacceptable for a chemical-resistant membrane.

8.2 The following guidance regarding spray equipment set-up is offered as a starting place and may vary with environmental conditions, equipment arrangement, and local availability.

| | |
|---|---|
| Mastic Pump | Graco Xtreme Airless Pump - X45DH4 (45:1 Fluid to Air Ratio) or X70DH4 (70:1 Fluid to Air Ratio). All pumps should have inlet siphon hose/tube removed. A piece of 1 1/2-inch (38 mm) pipe should be cut and threaded the depth of a 5-gallon pail. Inlet of the pump pipe should be submerged in product. |
| Hydra-mastic Gun | Graco Mastic Gun XTR705 |
| Gun Tip | XHD001 Housing, XHD543 Tip |
| Material Hose | 50-foot (15 m) x 1/2-inch (13 mm) hose H75050, 2 sections.<br>Above hose sizes depend on length of run anticipated and pump size. 3/8-inch (9 mm) hose to gun is preferred due to more flexibility but gun must be close enough to pump. Temperature may impact hose selection as viscosity is increased in cooler weather. Contact spray equipment manufacturer if in doubt. |
| Hydra-mastic Gun | Graco Mastic Gun XTR705 |
| Inline Filter | None |
| Air Compressor | 150 SCFM (4.25 cubic meter) at 100 psi (6.9 bar) |
| Air Regulator | 3/4-inch (19 mm) minimum size |

8.3 For small details and touch-up, Tufchem II Membrane Spray Grade may be applied with a brush or roller, or substitute Tufchem II Membrane (trowel grade) for verticals or overhead.

8.4 When a work stoppage is anticipated, remove as much of the wet Tufchem II Membrane Spray Grade as it is practical 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.

8.5 For vertical surfaces it is often not possible to apply membrane to a thickness greater than 60 mils (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. Apply membrane in a minimum number of passes at 60 to 90 (1.5 to 2.3 mm) per pass to achieve the specified film thickness.

8.6 Membrane must be wet to "tacky-wet," the stage during which the product will leave a black residue on fingers when touched, to form a chemical bond between passes or coats. Build film thickness wet-on-wet. Plan work to avoid top-coating cured material.

8.7 Provided membrane is still in the "tacky-wet" stage, it may be top-coated. The following are estimates of the time it will remain tacky enough to topcoat. Good air circulation or direct sunlight will reduce the recoat window.

| Air and Substrate Temperature | Estimated Recoat Window |
|---|---|
| 50°F (10°C) | 16 hours |
| 70°F (21°C) | 4 hours |
| 90°F (32°C) | 2 hours |

8.8 If membrane has cured beyond the "tacky-wet" stage, mechanically abrade the surface to remove the gloss and roughen it then wipe it with a clean rag dampened with isopropyl alcohol before top-coating.

## *9. CURING OF LINING*

9.1 Cure of the applied membrane is affected by air and substrate 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 with silica flour 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 can be prepared and then deemed as an acceptable work standard by all parties. Measure and record wet film thickness in at least 4 random locations for every 100 square feet or 10 square meters. This area shall establish the standard for the remaining work.

11.3 A suggested starting point for recordkeeping is as follows: Measure the ambient air and material temperature in the mixing and work area and record 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 Tufchem II Membrane Spray Grade kit and check them for full cure the next day. The moisture dewpoint can also be measured and recorded every two hours of the working period during application. Third party inspectors may establish further recordkeeping guidelines.

11.4 Spark Testing can be performed on Tufchem II Membrane Spray Grade. Test membrane applied over metal substrates for discontinuities in accordance with AMPP SP0188 using a high-voltage holiday detector set to

100 volts per mil (0.001"/25 µm). Mark defects, including detected pinholes, damaged areas, thin spots, and other imperfections with chalk.

### *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. There will remain traces of black on the cured primer.

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 armor-inc.com.

13.3 Please contact Armor for further information at +1-877-98ARMOR (982-7667) or customerservice@armor-inc.com.

***www.armor-inc.com***