



INSTALLATION SPECIFICATION SULFUR PIT GUNITE LININGS

1. SCOPE

- 1.1 This specification governs the installation of materials, reinforcement, surface preparation, membrane application and application of gunite for the lining of either a steel or concrete sulfur pit.
- 1.2 This specification shall also be used in conjunction with information presented on all applicable product data sheets and any associated specifications referenced therein.

2. MATERIALS

- 2.1 Tufchem™ Silicate Gunite (data sheet CE-238) is a specialty inorganic polymer concrete that is resistant to all concentrations of sulfuric acid that can be created by the normal operation of a sulfur pit. Consult Armor specification CES-322 for a comprehensive guideline outlining the gunite method of installation. It is applicable to the installation of the Tufchem Silicate Gunite material, and this specification as well.

Tufchem Silicate Gunite is a specialized gunite material and shall be installed only by contractors employing nozzle men and operators skilled in the art of guniting, and who must have adequate work experience of a similar nature.

- 2.2 In sulfur pit service Pacmastic™ 325 Membrane (date sheet CE-249) is first applied onto the prepared substrate before application of the gunite lining. It serves as a corrosion resistant and oxygen barrier to the underlying substrate.

3. ENVIRONMENTAL

- 3.1 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). The temperature of the substrate surface, working area, air, and Tufchem Silicate Gunite Powder should all be maintained at a minimum of 50°F (10°C) during application and curing period. A temperature of 70°F (21°C) is strongly preferred for optimal handling.
- 3.2 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 materials are applied. If temperatures are below 50°F (10°C) consult Armor.

4. SURFACE PREPARATION

- 4.1 Steel substrate surfaces must be cleaned, and free from paint, rust, scale or any other material that will prevent bond. A commercial blast (SSPC SP6) is suggested in preparing the substrate to receive a gunite lining. Consult specifications for the membrane and primer installation for full details.
- 4.2 New concrete should be cured for a minimum of 14 days and must be free of any curing films or laitance. New concrete surfaces to be lined require an abrasive blast to create a roughened profile and remove any weak surface laitance. Repair bug holes and voids. Existing concrete surfaces require water blasting and neutralizing as outlined in ASTM D4261 to achieve a neutral surface pH.

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- 4.3 Any contaminated or deteriorated concrete surface should be cleaned by either sandblasting, high pressure water blasting, or chipping to obtain a clean, structurally sound surface. Neutralize prepared surface to further remove contamination if present. Repair all cracks in accordance with good industry practice before proceeding.
- 4.4 Surfaces which are not to be gunned must be protected with plastic or other adequate means. The fine particles of gunite adhere to almost any surface. It is always less expensive to properly protect surfaces not to be covered than remove the over-spray.

5. MEMBRANE APPLICATION

- 5.1 Prime both steel or concrete substrates with Penntrowel™ Epoxy Primer or Novocoat™ SC1100 before application of the membrane. Consult primer data sheets and installation specification for full details.
- 5.2 Apply Pacmastic™ 325 Membrane by airless spray or trowel to achieve a nominal DFT (dry film thickness) of 125 mils (3 mm). Consult membrane data sheet and installation specification for full details.

6. ANCHORAGE

- 6.1 A suitable anchorage system must be used to retain Tufchem Silicate Gunite linings against the substrate. The grade of metallic alloy, the size of the anchor, spacing orientation, mesh size, stud location, etc., shall be a function of the specific application and lining thickness and shall be as specified for the respective job. When guniting overhead, or where vibrational considerations are important, special considerations must be given to confirm adequate anchoring. Tufchem Silicate Gunite is usually used in corrosive environments; an alloy anchor is almost always suggested.
- 6.2 A nominal 2" (50 mm) lining thickness is the suggested minimum lining thickness although a 3" (75 mm) or 4" (100 mm) thickness has also been specified. Anchors need to be sized to match the lining thickness. As an example, for a 2" (50 mm) thickness the anchor dimensions shall be 3.25" (81 mm) overall, drilled into the concrete to a depth of 2.25" (56 mm) using a hammer drill with a 1/4" x 6", (6 mm x 150 mm) drill bit. Upon splitting anchors, the anchor height should not exceed 1.5" (38 mm) ensuring at least ½" (13 mm) coverage over the anchor.
- 6.3 Anchor spacing is a function of lining thickness and orientation, and shall follow good industry practice. An approximate anchor count per square foot is as follows for the following examples:
- 9" spacing 1.89 anchors - therefore 10 sf (0.9 sm) x 1.89 = 19 anchors per 10 sf (0.9 sm)
 - 8" spacing - 2.33 - therefore 10 sf (0.9 sm) x 2.33 = 23 anchors per 10 sf (0.9 sm)
 - 6" spacing- 4.03 - therefore 10 sf (0.9 sm) x 4.03 = 40 anchors per 10 sf (0.9 sm)

Note: Insufficient anchor spacing or undersized anchors will result in the gunite lining cracking and falling away from the substrate. If in doubt install more anchors rather than fewer.

7. PERSONAL PROTECTION

- 7.1 Tufchem Silicate Gunite contains a reactive component in the powder. This catalyst is a skin irritant, and care must be taken that especially the nozzle man and anyone else who may encounter the mixed material shall have adequate personal protection equipment (PPE). Pay particular attention to confirm the wrists, face, and neck areas are not exposed. If necessary, tape the wrist area to prevent dust and rebound from entering around the sleeve.

8. STORAGE AND SHELF LIFE

- 8.1 Consult individual product data sheets for specific shelf-life information.

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 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.
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