Corrosion Engineering	
AN ERGONARMOR COMPANY	**TECHNICAL INFORMATION**

CES-339
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CORROSION ENGINEERING SPECIFICATION FOR INSTALLATION

ACID-RESISTANT GUNITE AND MEMBRANE LININGS FOR SULFUR PITS

1. SCOPE OF WORK

1.1 This specification will outline the materials, reinforcement, surface preparation, application of membrane and application of gunite for the lining of either steel or concrete sulfur pits

2. MATERIALS

2.1 Potassium silicate cements are resistant to sulfur and all concentrations of sulfuric acid that can be created by the normal operation of a sulfur pit. These cements, when suitably reinforced, have been found to be a cost-effective, acid-resistant lining for such pits.

2.2. Potassium silicate cements, installed by the dry gunite method, may either be a single component Gunite Mix SDX® or a 2-component TUFCHEM® Silicate Gunite. The gunned density of the products shall range between 120-135 lbs./cu.ft. wet.

2.3 Chemical-Resistant Membrane. PACMASTIC® 325 Membrane, high temperature membrane, is used in combination with potassium silicate cements for sulfur pit linings.

3. SURFACE PREPARATION

3.1 Unless specified to the contrary, A36 or A242 carbon steel shall be blasted to a near-white metal finish conforming to SSPC-SP#10 or NACE #2. No mil profile is required. Steel surface should be from oil, grease, mill scale, rust or other contaminants.

3.2 All welds shall be continuous. Intermittent or spot welding is not acceptable.

3.3 Weld splatter, slag, old anchor welds shall be removed and the area ground flush with the substrate. Chipping is acceptable if followed by grinding for finish. Pinholes, pits, blind spots, porosity, under-cutting or similar depressions shall not exist in the finished surface of the weld before or after blast cleaning.

3.4 All edges, fillets, and similar abrupt contours shall be rounded off smoothly by grinding or machining to a 1/8" or 3mm minimum radius. Smooth ripple-finished welds are acceptable.

3.5 New concrete surfaces to be lined require an abrasive blast to create a roughened profile and remove any weak surface latence. Consult ASTM D-4259 entitled “Practice for Abrading Concrete”.

3.6 Existing concrete surfaces are generally very rough in texture, and only require a surface neutralization prior to installation of the membrane. A high pressure water blast followed by neutralizing wash as outlined in ASTM D-4261 is recommended. Surface pH as measured in accordance with ASTM D-4262 should be between 6 and 9.

4. REINFORCEMENT OF GUNITE LINING

4.1 The acid-resistant potassium silicate gunite must be anchored. Anchorage shall be a minimum of 304 stainless steel V-Type metal anchors, or material suitable to the corrosive environment typically 1/8" thick x 5/8" wide, crimped 2-tine anchors. See CES-329 for more information on retaining anchors.

4.2 The stud anchors shall be welded in accordance with the anchor manufacturer's specifications.

4.3 Anchors shall be placed in a standard square pattern on the floors, walls and overheads. Anchor spacing shall be as recommended on CES-329 "Corrosion Engineering Specifications for Sizing and Spacing of V-Type Metal Anchors for Castable Gunite Lining Installation".

4.4 Anchors into concrete are to be retained using suitable industrial anchoring devices that are embedded into the concrete. The anchors are then attached to the embedded anchor by mechanical means - generally by threading into the embedded anchor.

5. SURFACE PRIMING

5.1 To prevent flash rust bloom on steel substrates, and maintain a uniform surface, steel surface shall be primed with PENNGUARD® Block Primer after abrasive blasting.

5.2 Concrete surfaces should be primed with PENNTROWEL® Epoxy Primer prior to installation of the PACMASTIC® 325 Membrane.

6. BENDING OF ANCHORS

6.1 After priming is completed, each anchor shall be bent with a hammer or heavy wall tubing bending tool so that the angle is greater than 90° between the tines, but less than 180°. They shall be bent in such a manner that there is a minimum 3/4" gunite coverage over the tips of the tines.

6.2 Any anchor welds that fail during bending the anchors shall be completely removed and replaced.

7. APPLICATION OF CHEMICAL-RESISTANT MEMBRANE

7.1 PACMASTIC® 325 shall be applied via the airless spray method to a minimum dry film thickness of 1/8". It may require a minimum of two coats to achieve the dry film thickness. See Product Data Sheet CE-249 for further instructions on application, equipment and curing.

7.2 Please see the data sheet on PACMASTIC 325 Coatings for application and curing information. The dry film thickness of PACMASTIC 325 Coating shall be 1/8".

7.3 Great caution should be taken to insure the membrane totally encapsulates the bent anchor, paying particular attention to include the back side of the anchor.

8. APPLICATION OF POTASSIUM GUNITE LININGS

8.1 The potassium silicate gunite lining shall be installed by the dry gun method as outlined in CES-329. A nominal 2" thickness of gunite shall be applied with a minimum thickness of 1.5". The tips of the reinforcing tines must be covered by 3/4" of gunite minimum.

8.2. Prior to installation, gunite powders and solutions must be stored as close to 70°F as possible.

8.3 If a single component potassium silicate gunite is desired, Gunite Mix SDX® shall be specified. Product Data Sheet CE-221 lists the application and curing information on Gunite Mix SDX®.

8.4 Should a 2-component potassium silicate gunite cement be desired, TUFCHEM® Silicate Gunite, Product Data Sheet CE-238, application and curing procedures shall be followed.

9. SAFETY PRECAUTIONS AND DISCLAIMER

9.1 TUFCHEM Silicate Gunite, SDX, PACMASTIC® 325, and PENNGUARD® Primer, components, and mixes of them present a number of hazards. Read before using and follow the hazard information, precautions, and first aid directions on the individual product labels and Material Safety Data Sheets.

9.2 The statements, technical information and recommendations contained herein are believed to be accurate as of the date hereof. Since the conditions and methods of use of the product and of the information referred to herein are beyond our control, Corrosion Engineering expressly disclaims any and all liability as to any results obtained or arising from any use of the product or reliance on such information; NO WARRANTY OF FITNESS FOR ANY PARTICULAR PURPOSE, WARRANTY OF MERCHANTABILITY OR ANY OTHER WARRANTY, EXPRESS OR IMPLIED, IS MADE CONCERNING THE GOODS DESCRIBED OR THE INFORMATION PROVIDED HEREIN. The information provided herein relates only to the specific product designated and may not be applicable when such product is used in combination with other materials or in any process. The user should thoroughly test any application before installation. Nothing contained herein should be taken as an inducement to infringe any patent and the user is advised to take appropriate steps to be assured that any proposed use of the product will not result in patent infringement.

9.3 Please contact Corrosion Engineering for specific recommendations at +1-610-833-4000 or fax +1-610-833-3040.

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