Published technical data, instructions, and pricing are subject to change without notice. Contact your Tnemec technical representative for current technical data, instructions, and pricing. Warranty information: The service life of Tnemec's coatings will vary. For warranty, limitation of seller's liability, and product information, please refer to Tnemec's Product Data Sheets at www.tnemec.com or contact your Tnemec Technical Representative. 11/2015
1.0 INTRODUCTION

The purpose of this guide is to acquaint contractors and applicators with the basic information necessary for properly ordering and installing Tnemec’s Series 217 MortarCrete. Prior to starting work, please read this entire guide carefully. It is important to adhere to all procedures, limitations and cautions for the Series 217 MortarCrete in the current product data sheet and MSDS and that you obtain answers to any questions before work begins. This application guide cannot cover every issue that may be encountered in the field. If you have questions or if issues arise that are not addressed in this guide or on the Product Data Sheet, please contact your Tnemec representative or call 1-800-TNEMEC1 for assistance.

Please review all pertinent Tnemec Product Data Sheets and other corresponding Application Guides. Reference the project specification and compare them with this guide and Product Data Sheet. Resolve any inconsistencies prior to starting work. For additional information consult the recommendations of the International Concrete Repair Institute (ICRI) Guidelines No. 310.1R (formerly No. 03730), “Guide for Surface Preparation for Repair of Deteriorated Concrete Resulting from Reinforcing Steel Corrosion,” or No. 310.2 (formerly No. 03732), “Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, and Overlays,” and the American Concrete Institute (ACI) Repair Application Procedure (RAP) - 6 “Vertical and Overhead Spall Repair by Hand Application” and ACI RAP-12 “Concrete Repair by Shotcrete Application”. Failure to follow good trade practices and recommendations herein may result in decreased material performance.

2.0 PRODUCTS & PACKAGING

2.1 SERIES 217 MORTARCRETE

Series 217 MortarCrete is a single-component, rapid setting, non-shrinking hydraulic cementitious resurfacer used to restore deteriorated concrete prior to top coating with Tnemec high-performance liners.

Series 217 LPK is packaged in a bag inside a 5 gallon plastic bucket containing 55 lbs (25 kg) of blended specialty cements, aggregates and admixtures.

<table>
<thead>
<tr>
<th>SERIES 217 PACKAGING</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIT SIZE</td>
</tr>
<tr>
<td>Bucket (LPK)</td>
</tr>
</tbody>
</table>

* Refer to Series 211-217 Slow Set product data sheet. Note: A trial batch is recommended to adjust the setting time to match jobsite conditions.

2.2 SPREADING RATES (THEORETICAL)

<table>
<thead>
<tr>
<th>THICKNESS</th>
<th>SQUARE FEET</th>
<th>SQUARE METERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4&quot;</td>
<td>21.6</td>
<td>.635 cm 2</td>
</tr>
<tr>
<td>1/2&quot;</td>
<td>10.8</td>
<td>1.27 cm 1</td>
</tr>
<tr>
<td>3/4&quot;</td>
<td>7.2</td>
<td>1.91 cm 0.7</td>
</tr>
<tr>
<td>1&quot;</td>
<td>5.4</td>
<td>2.54 cm 0.5</td>
</tr>
<tr>
<td>1 1/4&quot;</td>
<td>4.3</td>
<td>3.18 cm 0.4</td>
</tr>
<tr>
<td>1 1/2&quot;</td>
<td>3.6</td>
<td>3.81 cm 0.33</td>
</tr>
<tr>
<td>1 3/4&quot;</td>
<td>3.0</td>
<td>4.45 cm 0.28</td>
</tr>
<tr>
<td>2&quot;</td>
<td>2.7</td>
<td>5.08 cm 0.25</td>
</tr>
<tr>
<td>3&quot;</td>
<td>1.8</td>
<td>7.62 cm 0.16</td>
</tr>
<tr>
<td>4&quot;</td>
<td>1.3</td>
<td>10.16 cm 0.12</td>
</tr>
</tbody>
</table>

Approximate Unit Yield and Theoretical Spread Rate based upon 4 quarts (3.8L) of water.

2.3 SERIES 211-217 SLOW SET

Series 211-217 Slow Set is a retarding additive used to slow the setting of Series 217. Series 211-217 is packaged in 0.9 oz (25 g) packets, ordered separately. Up to three (3) packets may be used for each unit of Series 217, depending on jobsite conditions at the time of application. Refer to the Series 211-217 product data sheet for additional instructions.

2.4 STORAGE & CONDITIONING

Condition product to 65-75°F (18-24°C) 24 hours before use. Protect from moisture; store in a dry environment. Material temperatures above or below this range could result in undesirable material working properties.

2.5 SHELF LIFE

Six (6) months in original, unopened packing at recommended storage temperature. Discard any material exhibiting clumping or balling.

3.0 CONCRETE SURFACE PREPARATION

Concrete surface needs to be roughened to a minimum of an ICRI-CSP6 profile to allow Series 217 to achieve proper mechanical interlock.
3.1 INITIAL CONCRETE REMOVAL
Remove all loose, deteriorated, damaged, or defective concrete to sound substrate to a minimum distance of one inch (25 mm) beyond the delaminated area by abrasive blasting or high-pressure water jetting.

3.2 REINFORCING STEEL REPAIR
Where corrosion of the reinforcement steel (rebar) exists, continue concrete removal along the corroded steel and any adjacent areas which show evidence of corrosion-induced damage that would inhibit bonding of repair material. When the exposed reinforcing steel has loose rust, corrosion products, or is not well bonded to the surrounding concrete, removal should include undercutting the corroded reinforcing steel by approximately ¾ in (19 mm) in accordance with ICRI Guideline No. 310.1R. Every precaution should be made to avoid cutting underlying reinforcement. All exposed reinforcement surfaces shall be thoroughly cleaned of all loose concrete, rust, and other contaminants.

A protective coating such as Series 1 or N69 can be applied to the reinforcement after surface preparation. Avoid spillage or application onto the parent concrete.

3.3 EDGE CONDITIONING
Removal of limited areas of the concrete in a wall or soffit surface requires saw-cutting the perimeter of the removal area, providing an adequate minimum thickness of repair material at the edge of the repaired area. The shape of the prepared cavity should be kept as simple as possible—generally square or rectangular in shape (Figure 1).

The edges of the patches should be saw cut perpendicular to the surface to a minimum depth of ¼” (6 mm) to avoid feather edging and to provide a squared edge. Break out repair area to a minimum depth of ¼ in (6 mm) (Figure 2).

3.4 CRACKS
All active hydrostatic leaks in cracks must be stopped using suitable urethane grout. Remove all excess grout outside of crack. Static structural cracks may be routed to a depth of 1/4 inch (6 mm) and filled with properly mixed Series 217.

3.5 FINAL SURFACE CLEANING
The concrete left in place shall be prepared by abrasive blasting or high-pressure water jetting to ensure the removal of any remaining damaged concrete, existing coatings, laitance, and other bond-inhibiting materials in accordance with SSPC-SP13/ NACE No. 6 Surface Preparation of Concrete, and to produce a surface profile equivalent to the ICRI-CSP6 (or greater) amplitude.

If the bond surface is produced by a vigorous mechanical method, such as pneumatic hammering, the surface will be very rough, but micro cracks may be induced just beneath the prepared surface. Tensile bond strength is sensitive to the existence of surface defects, such as micro cracks in substrate.

Check the concrete surface after cleaning to ensure the surface is free of additional loose aggregate or that additional delamination are not present. If high-pressure water jetting is used, cement and particulate slurry must be removed from the prepared surface before slurry hardens.

4.0 MIXING
Obtain proper mixing equipment.

Remove Series 217 from the 5 gallon plastic pail. Add 3-5 quarts of potable water to a clean bucket. Note: Elevated water temperature can significantly reduce working time. Note: For repair of large bug-holes, honeycomb and other cavities deeper than the recommended maximum thickness, 15-20 lbs of locally purchased pea gravel (coarse aggregate) can be post-added with 3.0 to 3.5 quarts of water to Series 217, to create “dry-pack” mortar. One half inch to No. 8 size (12.5 mm to 2.36 mm) pea gravel conforming to ASTM C 33 is recommended. Contact your Tnemec representative or Tnemec Technical Services for additional information. Optional: Depending on the ambient temperature and desired consistency, add up to 3 packets of Series 211-217 Slow Set additive into the mixing water (refer to the Series 211-217 product data sheet). Under mechanical agitation with a slow-speed drill (400-600 rpm) and H-Style (box blade) mixing paddle, slowly sift powder into mixing bucket. Mix 1-4 minutes until fully blended. Avoid extended over-mixing.
4.1 SERIES 211-217 SLOW SET SUGGESTED DOSAGE

<table>
<thead>
<tr>
<th>UNIT SIZE</th>
<th>PART A (CEMENT BLEND)</th>
<th>AMBIENT TEMP.</th>
<th>PKG’S OF 211-0217</th>
</tr>
</thead>
<tbody>
<tr>
<td>LPK</td>
<td>55 lbs. (25kg)</td>
<td>70°F (21°C)</td>
<td>1 (25 grams)</td>
</tr>
<tr>
<td>LPK</td>
<td>55 lbs. (25kg)</td>
<td>80°F (27°C)</td>
<td>2 (50 grams)</td>
</tr>
<tr>
<td>LPK</td>
<td>55 lbs. (25kg)</td>
<td>90°F (32°C)</td>
<td>3 (75 grams)</td>
</tr>
</tbody>
</table>

Under mechanical agitation with a 10 amp, 3/4 inch heavy duty, slow-speed drill (400-600 rpm) and H-Style (box blade) mixing paddle, slowly sift Series 217 MortarCrete powder into mixing bucket. Mix one to four minutes until fully homogenous. Material may initially appear dry, but continued agitation will wet out cement and create a plastic consistency. Avoid excessive mixing (rpm’s) which can entrain air.

Mix only the appropriate number of units that can be placed in 10 to 15 minutes. Do not retemper (add additional water) Series 217 after initial mixing.

4.2 GROUT PUMPS

Material may also be mixed and spray transferred to the substrate using low-pressure grout pumps, carousel pumps, or high-pressure wet-mix shotcrete equipment. Consult equipment manufacturer recommendations for specific details and instructions.

5.0 APPLICATION

5.1 TEMPERATURE REQUIREMENTS
Minimum substrate and ambient application temperature 45°F (7°C) and rising. Do not apply if expected to fall below this temperature within 24 hrs of application.

5.2 PRE-WETTING
Concrete substrate shall be “pre-wet” or dampened with potable water to a Saturated Surface Dry (SSD) condition prior to Series 217 application; the concrete substrate is darkened by water but there is no pooling of water on the concrete.

5.3 BOND (SCRUB) COAT
IMPORTANT: Work a thin bond (scrub) coat of Series 217 into the SSD substrate using a rubber float or masons brush. A bond coat is necessary to fill pores, to ensure intimate contact and to help prevent sloughing or sagging of repair materials on vertical and overhead surfaces.

5.4 MATERIAL APPLICATION
Apply the Series 217 with adequate pressure before the bond scrub coat dries. Thoroughly consolidate the repair material into the corners of patch and around any exposed reinforcement steel in the repair zone. Full encapsulation of the reinforcement and intimate contact with substrate is important for long-term durability.

5.5 FINISHING
Finish Series 217 MortarCrete by striking off with straight edge and closing with steel trowel. Wooden or plastic floats or rubber sponges may also be used to level and close the repair material. Use recommended concrete finishing tools to create a smooth surface and properly cure. Note: Series 217 cannot be applied in multiple lifts.

6.0 CURE SCHEDULE

<table>
<thead>
<tr>
<th>TEMPERATURE</th>
<th>INITIAL SET</th>
<th>FINAL SET</th>
<th>TO TOPCOAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>70°F (21°C)</td>
<td>60 Minutes</td>
<td>90 Minutes</td>
<td>12 Hours</td>
</tr>
</tbody>
</table>

Note: Use Series S211-217 Slow Set additive to extend set times. Refer to Series 211-217 product data sheet for information.

7.0 TOPCOATING

When topcoating with other Tnemec products, Series 217 MortarCrete must be mechanically prepared in accordance with SSPC-SP13/NACE No. 6, ICRI-CSP 4-5 surface profile. This ensures complete removal of the weak upper laitance layer and creates the necessary surface amplitude for topcoating.

7.1 SURFACE CRACKING
Surface cracks may require filling with Series 215 Surfacing Epoxy or Series 218 MortarClad prior to topcoating to prevent crack transfer. Consult Tnemec Technical Services for additional information.

7.2 OUTGASSING
Outgassing must always be considered a possibility with any concrete substrate, including Series 217 MortarCrete. Several means exist to either reduce or eliminate outgassing. First, application of topcoats should be accomplished in indirect sunlight and during times when the surface temperature of the concrete is in a descending pattern. Secondly, the use of primers can help reduce outgassing over Series 217.
8.0 HEALTH & SAFETY

Series 217 is for industrial use only and shall be installed by a qualified installer. Cementitious products contain chemical ingredients which are considered hazardous. Read container label warning and Material Safety Data Sheet for important health and safety information prior to the use of this product. Keep out of the reach of children.