Spin-Cast GeoPolymer Lining

STRUCTURAL PIPE RENEWAL SYSTEM

Use the GeoCast™ Pipe Renewal system to rehabilitate and repair existing Corrugated Metal Pipe (CMP), Reinforced Concrete Pipe (RCP), brick pipe, brick manholes, storm water pipe culverts, tunnels and wastewater infrastructure.

As a Sustainable Green Technology the GeoCast™ Pipe Renewal system uses a patented spin-cast geopolymer lining technology. This high performance, fibre reinforced, corrosion resistant mortar is placed by centrifugally casting or using an air atomising shotcrete nozzle to apply the geopolymer liner.
The GeoCast™ Process

The high performance geopolymer mortar with densified micro silica powder, flyash, pozzolanic materials and other select admixtures is designed for both new and existing CMP, concrete and brick pipes.

GeoCast™ is a proven trenchless technology. The use of Geocast Geopolymer structural linings will reduce service downtime and will rehabilitate existing structures with a design life of over 50 years.

Pre-installation cleaning and inspection is performed to identify pipe material, pipe size, pipe length and defects. High pressure water blast at minimum 4000psi is required for adequate removal of rust, dirt and laitance.

All active water leaks and infiltration is plugged and patched with Custom Plug® hydraulic cement. Chemical grout injection or flowable fill grout pumping may be used for filling large voids around pipe.

Depending on the pipe size and configurations, use either the GeoCast™ Pipe Renewal spin-cast head and sled or a low pressure, air atomising, wet shotcrete nozzle for applying a monolithic, geopolymer liner.

- Increase strength by over 100%
- Fast turnaround
- Anti corrosion – acid resistant
- Early strength and long term durability
- Proven for over 25 years
- Tenacious bond & low permeability

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GeoCast Geopolymer Mortar

GENERAL
GeoCast Geopolymer is a single component, dry packaged, polymer-modified mortar with microsilica geopolymer, pozzolan, flyash and select admixtures. It is specifically designed for horizontal, vertical and overhead surface repairs in reinforced concrete and brick pipes, corrugated metal pipe inverts (CMP) and arches, sewer manholes and (water) wastewater structures. The GeoCast Geopolymer withstands hydrogen sulfide (H2S) corrosion. Geocast offers high early strength and long term durability.

APPLICATIONS
A Sustainable Green Technology Product, the GeoCast Geopolymer originates from the Reliner MSP® Cement co-patent technology being used in gunned shotcrete coating applications, existing construction rehabilitation, low-pressure spraying renewal and centrifugally [spin] cast applications.
• Applications to 100mm thicknesses overhead.
• Stops water infiltration in pipes, tunnels, manholes, wet wells, raw water filtration, bridges, dams, and treatment plant structures.
• Adds long term performance, tenacious bond and lower permeability.
• Formulated with freeze thaw durability advantages on demand.
• Provides higher compressive, flexural and tensile strength.

PROTECTION LEVELS
Corrosion Resistance: GeoCast Geopolymer protects against corrosion, [MIC] hydrogen sulfide gas (H2S), sulfates, salt water, chlorides, water vapor, grease and acids to pH 2.0 (ASTM C267).
Chemical Composition: GeoCast Geopolymer differs significantly from ordinary Portland cement and will not corrode or attack the reinforcing steel. The geopolymer mortar contains microsilica powder admixture, polymer modifiers, polypropylene fibers and flyash that work together to produce a silica rich paste with increased abrasion resistance and reduced cracking.

PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Unit</th>
<th>24-hours</th>
<th>7-days</th>
<th>28-days</th>
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<tbody>
<tr>
<td>Compressive Strength</td>
<td>Mpa</td>
<td>24</td>
<td>31</td>
<td>&gt;62</td>
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<tr>
<td>ASTM C 109</td>
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<tr>
<td>Tensile Strength</td>
<td>Mpa</td>
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<td>ASTM C 496</td>
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<tr>
<td>Flexural Strength</td>
<td>Mpa</td>
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<td>ASTM C 78</td>
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<td>Bond Strength/Slant Shear</td>
<td>Mpa</td>
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<tr>
<td>Modulus of Elasticity</td>
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<td>ASTM C 496/ C 469M</td>
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<tr>
<td>Shrinkage at 50% RH</td>
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<td>ASTM C 596</td>
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<tr>
<td>Chloride Permeability AASHTO T 277</td>
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<td>&lt;300</td>
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<td>Sulfate Resistance – 90 days:</td>
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<td>Good</td>
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<td>ASTM C 267</td>
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<td>Slight</td>
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<tr>
<td>2,000 ppm (sulfuric acid)</td>
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</tr>
<tr>
<td>20,000 ppm (sulfuric acid)</td>
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<tr>
<td>Applied Density (28 days)</td>
<td>Kg/m³</td>
<td>135 ± 2</td>
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MIXING
Mix with clean, potable water. Do not add Portland cement or any other admixture to this product. Follow mixing instructions on the bag. 20 kg will require approx 2.8 to 3.2 litres of water.

YIELD
1 x 20 kg bag will yield approx 12.1 litres of mixed material.
**EQUIPMENT**

Hychem can advise on the type of equipment required. Equipment type can be customised for various project demands.

**PLACEMENT/ CURING**

Product can be wet or dry gunite sprayed. Surfaces need to be adequately prepared. Application thickness will be determined by engineering guidelines.

Working time 150 minutes at 23°C. Initial set time is approximately 4.5 hours at 23°C.

Place immediately by hand or shotcrete or gunite method. Follow ACI 302, “Guide for Concrete Floors and Slab Construction” and ACI 308 “Standard Practice for Curing Concrete” to avoid any shrinkage cracking problems due to decreased bleeding. Protect the mortar from hot weather extremes, air movement and dry conditions and direct sunlight.

Ambient temperatures and job conditions will govern specific curing and will dictate the use of a curing compound or plastic sheets. In some situations such as hot or cold conditions, external and exposed applications, special care may be needed. Please contact Hychem for specific curing details.

Make no application when the ambient temperatures are less than 4°C or freezing temperature is expected within 24-hour. Trial batches are recommended.

**SAFETY/ STORAGE**

Caution: contains fused calcium hydrates which may cause eye and skin irritation. Clean up with soap and water. Avoid prolong exposure. Wash with water immediately after handling. If skin problems arise, flush with water and get medical help.

Store in a dry, cool place, stocked in the original packaging. Keep out of reach of children.

**TECHNICAL SERVICE**

Please contact Hychem for any technical advice or guidance.

**WARRANTY INFORMATION**

The manufacturer warrants this product to be of good quality and free from defects within the warranty period. Workmanship is not guaranteed. The manufacturer reserves the right to determine whether any claim is specifically related to another cause. Hychem will issue warranties on a case by case scenario.

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