Concrete Canvas® GCCM

What is it?
Concrete Canvas® is part of a revolutionary new class of construction materials called Geosynthetic Cementitious Composite Mats (GCCMs). It is a flexible, concrete filled geosynthetic that hardens on hydration to form a thin, durable and waterproof concrete layer. Essentially, it’s concrete on a roll™. Concrete Canvas® GCCM (CC) allows concrete construction without the need for plant or mixing equipment: just add water.

CC consists of a 3-dimensional fibre matrix containing a specially formulated concrete mix. A PVC backing on one surface of the CC ensures the material has excellent impermeability. CC can be hydrated either by spraying or by being fully immersed in water. Once set, the fibres reinforce the concrete, preventing crack propagation and providing a safe plastic failure mode. Concrete Canvas® GCCM is available in 3 thicknesses: CC5™, CC8™ and CC13™, which are 5, 8 and 13mm thick respectively.

Concrete Canvas® GCCM User Benefits

Rapid Install
CC can be laid at a rate of 200m²/hour, up to ten times faster than conventional concrete solutions.

Easy to Use
The concrete is pre-mixed so there is no need for mixing, measuring or compacting. CC is also available in hand portable rolls for applications with limited access.

Lower Project Costs
The speed and ease of installation mean Concrete Canvas® GCCM is more cost-effective than conventional concrete, with less logistical complexity.

Eco-friendly
CC is a lower Carbon alternative to conventional concrete, which uses up to 95% less material for many applications.

Concrete Canvas® GCCM Key Properties

Water Proof
The PVC backing on one surface of the CC ensures that the material has excellent impermeability.

Strong
The fibre reinforcement prevents cracking, absorbs energy from impacts and provides a stable failure mode.

Durable
CC is 5 times as abrasion resistant as standard OPC concrete*, has excellent chemical resistance, weathering performance and UV resistance. CC is BBA certified with a durability in excess of 120 years when used in erosion control applications.

Flexible
CC has good drape characteristics and will closely follow the ground profile and fit around existing infrastructure. Unset CC can be cut or tailored using basic hand tools.
Concrete Canvas® GCCM Applications

Channel Lining
CC can be rapidly unrolled to form a ditch or line a channel. It is significantly faster, easier and less expensive to install than conventional concrete channel lining methods and requires no specialist equipment or training. CC can be laid at a rate of 200m² per hour by a 3 person team.

Slope Protection
CC can be used to protect slopes from surface erosion. Compared to shotcrete it is typically faster to install, more cost effective, requires less specialist plant equipment, and eliminates the risks associated with rebound and debris.

Bund Lining
CC provides a cost-effective alternative for lining secondary containment bunds. It acts as an effective weed suppressant, reducing maintenance costs as well as providing additional levels of impermeability. Its ability to be installed quickly reduces time on site, whilst the availability of hand portable rolls allows for installation in areas with reduced access.

Weed Suppression
CC is used to provide effective, durable and long-term weed suppression, reducing de-vegetation requirements and associated maintenance costs. CC can be used where de-vegetation is required to maintain operational and health and safety requirements, or where limited access and sensitive infrastructure prevents the use of traditional methods.
Remediation
Concrete Canvas® can be used to rapidly re-line and refurbish existing infrastructure suffering from environmental degradation and cracking. CC lined structures can be returned to operation in 24 hrs from installation.

Unlike structures re-lined with traditional concrete, the internal volume of CC lined structures is maintained ensuring that the channel design flow capacity is preserved.

Culvert Lining
Concrete Canvas® can be used to extend the durability of new build culverts and to upgrade existing structures, preventing the need for asset replacement.

The speed, ease and flexibility of CC offers significant technical and financial advantages, whilst offering a durable means of providing erosion protection. CC is used to replace, poured or sprayed concrete and bitumen coatings.

CC Properties (Pre-set)

<table>
<thead>
<tr>
<th>Test Method</th>
<th>Unit</th>
<th>Typical Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thickness</td>
<td>BS EN 1849-2</td>
<td>mm</td>
</tr>
<tr>
<td>Roll Width</td>
<td>m</td>
<td>1.0 1.1 1.1</td>
</tr>
<tr>
<td>Area of CC per Batch Roll</td>
<td>m²</td>
<td>10 5 N/A</td>
</tr>
<tr>
<td>Area of CC per Bulk Roll</td>
<td>m²</td>
<td>200 125 80</td>
</tr>
<tr>
<td>Mass per Unit Area</td>
<td>kg/m²</td>
<td>7 12 19</td>
</tr>
</tbody>
</table>

Density Increase on Curing % Increase 30-35

Working Time from Hydration (refer to the CC Hydration Guide) Hours 1 to 2

CC Properties (Post-set)

<table>
<thead>
<tr>
<th>Test Method</th>
<th>Unit</th>
<th>Typical Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compressive Strength of Cementitious Mix - 24 Hour/28 Day</td>
<td>BS EN 12390-3</td>
<td>MPa 50/80</td>
</tr>
<tr>
<td>Flexural Strength at 24 Hours from Hydration - Initial Break (MD)</td>
<td>ASTM D8058</td>
<td>MPa &gt;4.0</td>
</tr>
<tr>
<td>Flexural Strength at 24 Hours from Hydration - Final Break (MD)</td>
<td>ASTM D8058</td>
<td>MPa &gt;10 &gt;6 &gt;6</td>
</tr>
<tr>
<td>Freeze - Thaw Resistance (retained Initial Flexural Strength after 250 cycles)</td>
<td>BS EN 12467</td>
<td>% 95</td>
</tr>
<tr>
<td>Weathering Resistance (refer to CC Weather Resistance)</td>
<td>BS EN 12467</td>
<td>- Passed</td>
</tr>
<tr>
<td>Chemical Resistance (refer to CC Chemical Resistance)</td>
<td>BS EN 14414</td>
<td>- Passed</td>
</tr>
<tr>
<td>Abrasion Resistance (cementitious barrier depth of wear)</td>
<td>ASTM C1353</td>
<td>mm/1000 Cycles 0.2</td>
</tr>
</tbody>
</table>

Recommended Permissible Velocity (intermediate fixings may be required - contact CC Ltd)

Application Dependent m/s <8.6 >8.6

Please refer to Concrete Canvas® Data Sheet for additional information on testing and data.