MADE IN UK

BR WTRW 0636-04/2015

CONCRETE CANVAS®

Concrete Impregnated Fabric...

Distributed in South Africa by

KAYTECH ENGINEERED FABRICS

ROAD RAIL AGRO UTILITIES PETROCHEM MINING DESIGN OTHER

2013 Macrobert Award Finalist

2013 Innovation Award Winner Railtex Exhibition

2012 R&D 100 Award winner R&D Magazine

2011 Expert's Choice Winner Most Innovative Product

2011 Brit Insurance Designs of the Year Nominee

2009 Winner Material Connexion Medium Award Material of the Year

2007 Winner D&AD Yellow Pencil Product Desig

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Concrete Canvas®

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 impregnated fabric, that hardens on hydration to form a thin, durable, water proof and fire resistant concrete layer. Essentially, it's concrete on a roll. Concrete Canvas® GCCM allows concrete construction without the need for plant or mixing equipment. Simply position the mat and just add water.

Concrete Canvas® GCCM consists of a 3-dimensional fibre matrix containing a specially formulated dry concrete mix. A PVC backing on one surface of the mat ensures the material is completely water proof. The material 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

Concrete Canvas® GCCM can be laid at a rate of 200sqm/hour, up to 10 times faster than conventional concrete solutions.

Easy to Use

Concrete Canvas® GCCM is available in man portable rolls for applications with limited access. The concrete is pre-mixed so there is no need for mixing, measuring or compacting. Just add water.

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

Concrete Canvas® GCCM is a low mass, low carbon technology which uses up to 95% less material than conventional concrete for many applications.

Concrete Canvas® GCCM Key Properties

Water Proof

The PVC backing on one surface of the GCCM ensures that the material has excellent impermeability.

Strong

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

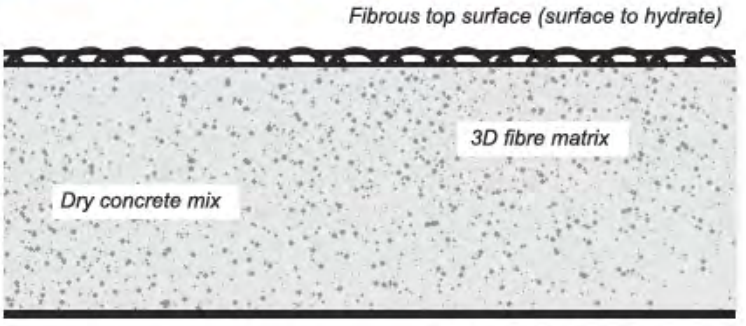
Durable

Concrete Canvas® GCCM is twice as abrasion resistant as standard OPC concrete, has excellent chemical resistance, good weathering performance and will not degrade in UV.

Flexible

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

Concrete Canvas® GCCM section



Batched rolls

Bulk roll

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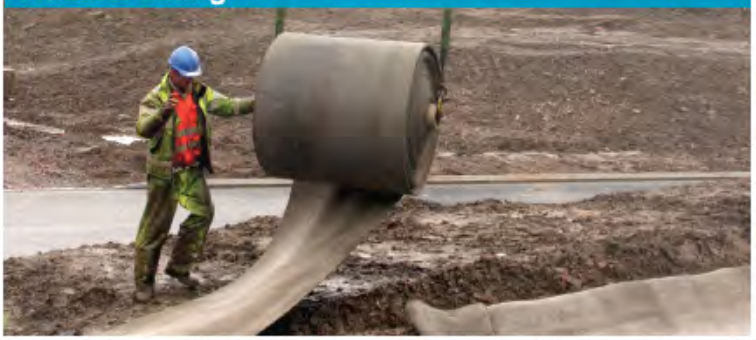
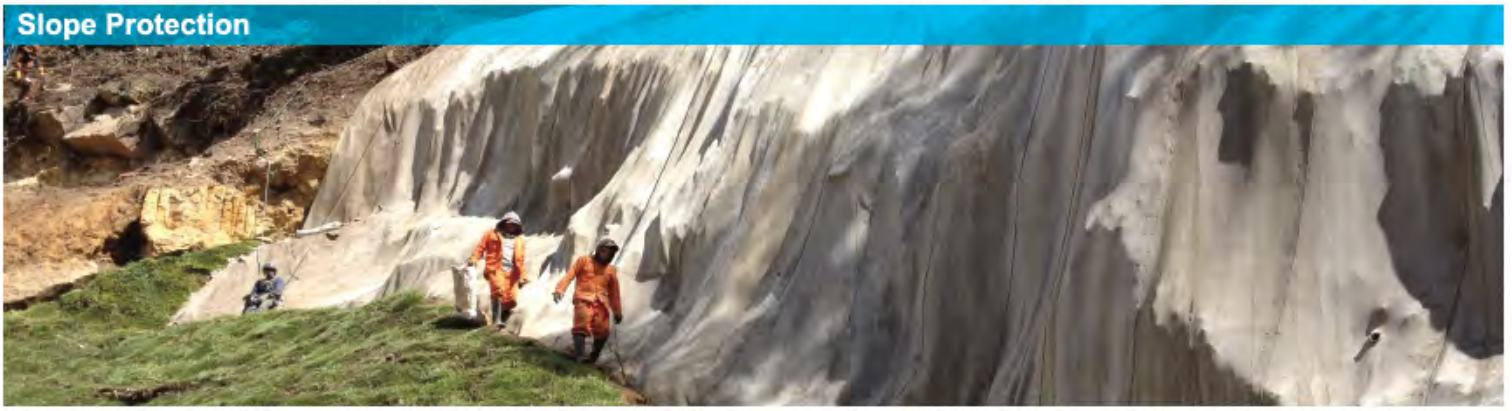
Concrete Canvas® GCCM Applications

Channel Lining



Concrete Canvas® GCCM can be rapidly unrolled to form a channel lining. It is significantly faster, easier and less expensive to install than conventional concrete channel lining and requires no specialist equipment. The matting can be laid at a rate of 200sqm/hr by a 3 person team.

Slope Protection



Concrete Canvas® GCCM can be used to stabilise and protect slopes as a replacement for shotcrete and steel mesh. It is typically faster to install, more cost effective, requires less specialist plant equipment, and eliminates the risks associated with shotcrete rebound and debris.

Bund Lining

Concrete Canvas® GCCM provides a cost-effective alternative to poured or sprayed concrete for lining secondary containment bunds. It acts as an effective weed supressant, reducing maintenance costs as well as providing additional levels of impermeability and fire protection. Its ability to be installed quickly reduces time on site, whilst the availability of man-portable rolls allows for installation in areas with reduced access.

Remediation

Concrete Canvas® GCCM can be used to rapidly reline and refurbish existing concrete structures suffering from environmental degradation and cracking.

Culvert Lining

Concrete Canvas® GCCM can be used as a cost-effective alternative to bitumen spraying or re-building damaged culverts, whilst offering a durable means of providing erosion protection.

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Concrete Canvas® Material Data

Concrete Canvas® Physical Properties*

Product	Thickness (mm)	Batch Roll Size (sqm)	Bulk Roll Size (sqm)	Roll Width (m)
CC5™	5	10	200	1.0
CC8™	8	5	125	1.1
CC13™	13	N/A	80	1.1

Product	Mass (unset) (kg/m2)	Density (unset) (kg/m3)	Density (set) (kg/m3)
CC5™	7	1500	+30-35%
CC8™	12	1500	+30-35%
CC13™	19	1500	+30-35%

Pre-Set Concrete Canvas® Properties

Setting

Working Time

1-2 hours subject to ambient temperature

CC will achieve 80% strength at 24 hours after hydration.

Method of Hydration

Spray the fibre surface with water until it feels wet to touch for several minutes after spraying.

Re-spray the Concrete Canvas® again after 1 hour if:

- Installing CC5™
- Installing on a steep or vertical surface
- Installing in warm climates

Notes:

- Concrete Canvas GCCM® cannot be over hydrated and an excess of water is always recommended.
- Minimum ratio of water:Concrete Canvas® GCCM is 1:2 by weight.
- Do not jet high pressure water directly onto the matting as this may wash a channel in the material.
- Concrete Canvas® GCCM can be hydrated using saline or non-saline water.
- Concrete Canvas® GCCM will hydrate and set underwater.
- Concrete Canvas® GCCM has a working time of 1-2 hours after hydration. Do not move the matting once it has begun to set.
- Working time will be reduced in hot climates.
- Concrete Canvas® GCCM will set hard in 24 hours but will continue to gain strength for years.
- If Concrete Canvas® GCCM is not fully saturated, the set may be delayed and strength reduced. If the set is delayed, re-wet with a large excess of water.

Contact Concrete Canvas Ltd. Local Distributor

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Post Set Concrete Canvas® Properties

Based on Concrete Canvas GCCM ® hydrated in accordance with the Concrete Canvas® Hydration Guide.

Strength

Very high early strength is a fundamental characteristic of Concrete Canvas® GCCM.Typical strengths and characteristics are as follows:

Compressive tests based on ASTM C109 – 02 (initial crack)
- 10 day compressive failure stress (MPa) 40

Bending tests based on BS EN 12467:2004 (initial crack)
- 10 day bending failure stress (MPa) 3.4
- 10 day bending Youngs modulus (MPa) 180

Tensile data (initial crack)

	Length direction (kN/m)	Width direction (kN/m)
CC5™	6.7	3.8
CC8™	8.6	6.6
CC13™	19.5	12.8

Reaction to Fire

Concrete Canvas® has achieved Euroclass B certification:
BS EN 13501-1:2007+A1:2009 B-s1, d0

Concrete Canvas® has achieved MSHA approval:
30 CFR, Part 7, Subchapter B, Section 7.24 Passed

Age Testing

Freeze-Thaw testing (ASTM C1185) 200 Cycles

Freeze-Thaw testing (BS EN 12467:2004 part 5.5.2) Passed

Soak-Dry testing (BS EN 12467:2004 part 5.5.5) Passed

Heat-Rain testing (BS EN 12467:2004 part 7.4.2) Passed

Water impermeability (BS EN 12467:2004 part 5.4.4) Passed**

Other

Abrasion Resistance (DIN 52108)
- Similar to twice that of OPC Max 0.10 g/cm²

Manning's Value (ASTM D6460) n = 0.011

Root Resistance (DD CEN/TS 14416:2005) Passed

Chemical Resistance (BS EN 14414)**
- Acid (pH 4.0) (56 day immersion at 50°C) Passed
- Alkaline (pH 12.5) (56 day immersion at 50°C) Passed
- Hydrocarbon (56 day immersion at 50°C) Passed
- Sulfate Resistance (28 day immersion at pH 7.2) Passed

Impact Resistance of Pipeline Coatings
ASTM G13 (CC13™ only) Passed

Concrete Canvas® Patent Information

Patent Protected

Pat Pend/Granted: AE (766/2011), AE (932/2006), ARIPO (AP/P/2011/005842), AU (2010209524), AU (2005254788), BR (PI1005309-3), CA (2655054), CA (2749991), CA (2570532), CL (01809-2011), CN(201080005835.6), CO (11-092824), EP (2027319), EP (2393970), EP (1766162), GB (2455008), HK (12100037.1), ID (W00 2011 028 25), IL (214350), IN (5429/DELNP/2011), IN (20/DELNP/2007), JP (2011-546962), KR (10-2011-7020005), MN (3644),MX (MX/a/2011/007802), MY (PI2011003536), NO (20070245), NZ (594823), OM (OM/P/2011/00162), PH (1-2011-501468), RU (2011134016), RU (2386767), SG (201105143-0), TH (1101001335), US (8287982), US (US-2010-0233417-A1), US (13/146836), US(7721749), US (13/708074), VN (1-2011-02023), ZA (2009/00222), ZA (2011/06289), ZA (2007/0471) and other patents pending.

Concrete Canvas® is a registered trade mark in the following and other territories - AM, BK, CO, HR, JA, KE, KZ, MA, MJ, MN, MO, NZ, RI, SN, SY, TU, TX, UP (1145571), CH(11173388) EM(011011475), MX(1369743).

* Occasionally there will be a Beam Fault (fabric imperfection under 100mm wide running across the width) in a Bulk Roll. This fault is unavoidable due to the manufacturing process and the fault will be clearly marked with a red tag, there will be a maximum of (1) one Beam Fault in any Bulk Roll. A joint may need to be made on site where there is a Beam Fault as the material at a fault will not reach the performance specified in this Data Sheet. The maximum un-useable material due to any Beam Fault will be 100mm. There are no beam faults in standard batched rolls.

* Indicative values

** For containment applications it is recommended to use Concrete Canvas® GCCM as a protective overlay in combination with an appropriate sealed membrane liner. Concrete Canvas® GCCM is not recommended as the sole barrier layer where impermeability is critical.

CE
Concrete Canvas Ltd.
CF37 5BP, United Kingdom
11
EN13467:2004
Concrete Canvas
Fibre cement sheet
NT
Overview sheets
Class 1, Category A
Reaction to Fire B-s1,d0