



CONCRETE CANVAS™

Concrete Impregnated Fabric...



ROAD



RAIL



AGRO



OTHER



POWER



OIL & GAS



DESIGN

CHAMBER AWARDS 2011

NATIONAL WINNER

National Winner
Chambers of Commerce
Award 2011



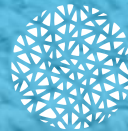
Top Innovation
BRE Insite 2011



2011 Expert's Choice Winner
Most Innovative Product



MTP Gold Medal Award
BUDMA 2011



Material ConneXion®
MEDIUM AWARD
MATERIAL of the YEAR 2009

2009 Winner
Material ConneXion Medium Award
Material of the Year



2011 Nominee,
2007 Finalist
Design to Improve Life Award



Concrete Canvas™



What is it?

Concrete Canvas (CC), is a flexible, cement impregnated fabric that hardens when hydrated to form a thin, durable, water proof and fire resistant concrete layer. CC allows concrete construction without the need for plant or mixing equipment. Simply position the Canvas and just add water.

CC consists of a 3-dimensional fibre matrix containing a specially formulated dry concrete mix. A PVC backing on one surface of the Canvas 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. CC is available in 3 thicknesses: CC5, CC8 and CC13, which are 5, 8 and 13mm thick respectively.

CC Key Facts

Easy To Use

CC is available in man portable rolls for applications with limited access or where heavy plant equipment is not available. There is no need for mixing or measuring, the concrete is premixed and cannot be over hydrated. It will set underwater and in sea water.

Rapid

Once hydrated, CC remains workable for 2 hours and hardens to 80% strength within 24 hours. Accelerated or retarded formulations can be produced to meet specific customer requirements.

Environmentally Friendly

CC is a low mass, low carbon technology which uses up to 95% less material than conventional concrete for many applications. It has minimal impact on the local ecology due to its limited alkaline reserve and very low wash rate. The impact on the environment is further decreased by reducing the need for plant equipment.

Flexible

CC has good drape characteristics allowing it to take up the shape of complex surfaces including those with a double curvature. Unset Canvas can be cut or tailored using basic hand tools.

Strong

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

Durable

CC is chemically resistant, has good weathering performance and will not degrade in UV.

Water Proof

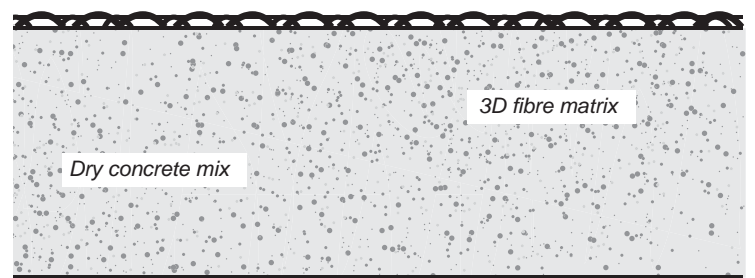
The PVC backing on one surface of the Canvas ensures that the material is completely water proof and chemically resistant.

Fire Resistant

CC is fire-safe, does not contribute to the surface spread of flames, has a low level of smoke development and minimal hazardous gas emissions. CC has achieved Euroclass classification B-s1, d0.

Concrete Canvas section

Fibrous top surface (surface to hydrate)



PVC backing (water proof layer)



Batched rolls



Bulk rolls



CC Applications

Ditch Lining



CC can be rapidly unrolled to form ditch or channel lining. It is significantly quicker and less expensive to install than conventional concrete ditch lining and requires no specialist plant equipment. The 30m ditch shown above was lined in 45min.

Bund Lining



Secondary containment bunds can be quickly lined with CC to provide an efficient, chemically resistant alternative to concrete walling.

Pipeline Protection



CC can be used as a coating for overland or underwater pipeline protection, providing a superior tough rock shield. In remote areas it can be used to coat steel pipe on site without expensive wet concrete application plants. CC will set underwater and provide negative buoyancy. CC13 meets the requirements of ASTM G13 .

Ground Resurfacing



CC can be secured with ground anchors to rapidly create a concrete surface for flooring, pedestrian walk-ways or dust suppression. CC8 and CC13 have been tested to EN 1991-1-1:2002 (Resistance to Imposed Loads on Vehicle Traffic Areas)

Slope Protection



CC can be used as slope stabilisation and other erosion control applications such as temporary and permanent slope protection, retaining walls, boulder fences, low level bunds and river bank and dam revetments.

Cable Protective Covering



CC can be installed in-line with existing cable laying equipment to provide protection against impact damage at a rate of 1000m/day. 200mm wide CC13 has been tested to BS 2484:1985 (Appendix A) Impact Resistance for Straight concrete and clayware cable covers.

Mining Applications



CC can be used as an alternative to poured or sprayed concrete or as a quick way of erecting strong permanent or temporary blast and vent structures and spall lining.

Other Applications



Other applications include use as a general replacement for shotcrete, retaining walls, scour protection, culverts, blinding layers, weed inhibiting, basement lining, water tanks, flood defences, tunnel lining architectural and design applications...



Concrete Canvas™ Material Data



Physical Properties*

CC	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

CC	Mass (unset) (kg/m ²)	Density (unset) (kg/m ³)	Density (set) (kg/m ³)
CC5	7.0	1500	+30-35%
CC8	12.0	1500	+30-35%
CC13	19.0	1500	+30-35%

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 CC again after 1 hour if:

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

Notes:

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

Reaction to Fire

CC has achieved Euroclass B certification:
BS EN 13501-1:2007+A1:2009

B-s1, d0

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Strength

Very high early strength is a fundamental characteristic of CC. Typical strengths and physical characteristics are as follows:

Compressive tests based on ASTM C473 – 07

- 10 day compressive failure stress (MPa) 40
- 10 day compressive Youngs modulus (MPa) 1500

Bending tests based on BS EN 12467:2004

- 10 day bending failure stress (MPa) 3.4
- 10 day bending Youngs modulus (MPa) 180

Tensile data

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

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

MOHS hardness 4-5

CBR Puncture Resistance EN ISO 12236: 2007 (CC8 & CC13 only)
- Min. Push-through force 2.69kN
- Max. Deflection at Peak 38mm

Resistance to Imposed Loads on Vehicle Traffic Areas

EN 1991-1-1:2002 (CC8 & CC13 only)
- Category G compliant
- Gross weight of 2 axle vehicle 30 to 160kN
- Uniformly distributed load not exceeding 5kN/sqm

Standard Test Method for **Impact Resistance of Pipeline Coatings**
ASTM G13 (CC13 only) Passed

Other

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

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

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

Moisture vapour transmission rate
PVC Thickness 0.42 mm
PVC MVTR range 0.836 - 0.924 g.mm / (m².day)

CC Static Head < 3000mm

Patent Information

Patent Protected

Pat Pend/Granted: AE (932/2006), AU (2005254788), BR (PI 0511408-0), CA (2570532), CA (2655054), EP (1766162), EP (2027319), GB (2455008), IN (20/DENP/2007), JP (2007-516049), NO (20070245), RU (2386767), SA (12/303,864), US (7721749), US (US-2010-0233417-A1), WO 2010/086618, ZA (2007/0471), ZA (2009/00222) and other patents pending.

* Indicative values

** For tanking applications where a 100% waterproof seal is required, it is recommended to use CC as a protective overlay in combination with an appropriate sealed membrane liner. CC is not recommended as the sole barrier layer where 100% impermeability is critical.



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