CONCRETE CANVAS™

Turkish Distributor


# BETON KUMAŞ®

*Concrete Impregnated Fabric...*

MTP Gold Medal Award
BUDMA 2011

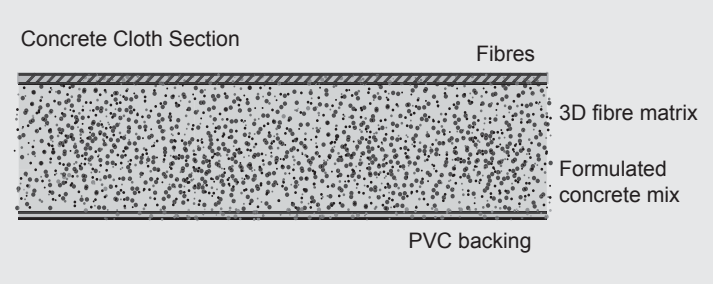
Material ConneXion®
MEDIUM AWARD
MATERIAL of the YEAR 2009

2009 Winner
Material Connexion Medium Award
Material of the Year

# BETON KUMAŞ®

## Concrete Cloth™

Concrete Cloth (CC), is a flexible, cement impregnated fabric that hardens when hydrated to form a thin, durable, water and fire proof concrete layer.




CC allows concrete construction without the need for plant or mixing equipment. Simply position the Cloth 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 cloth 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.

### Flexible

CC has good drape characteristics allowing it to take up the shape of complex surfaces including those with a double curvature. The unset Cloth 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 ensures that the material is completely water proof and chemically resistant.

### Fire Proof

CC is a ceramic and will not burn. It has achieved Euroclass classification B-s1, d0 according to BS EN 13501-1:2007+A1:2009.

*CC Batched Rolls*

*CC Bulk Roll*

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## CC Applications

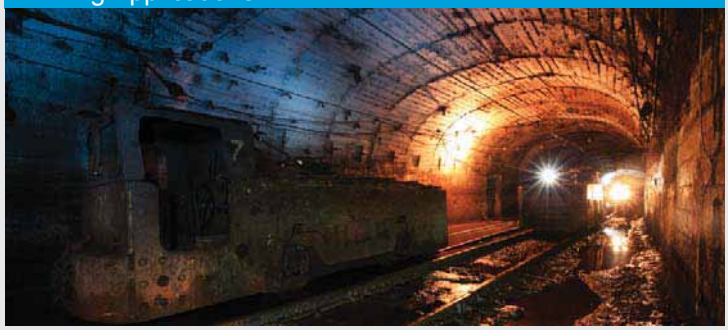
### Ditch Lining

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

### Gabion Reinforcement

CC can also be used to upgrade or repair existing gabion structures to provide a durable solution that can last for decades.

### Mining Applications



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

### Ground Surfacing

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 ISO 12236: 2007, CBR Puncture Resistance.

### Erosion Control

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

### 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 (Standard Test Method for Impact Resistance of Pipeline Coatings).

### Culverts

CC can be used as an effective and faster alternative to precast or cast-in-place concrete culverts.

### Building Cladding

CC can be used to create organic and custom moulded decorative panels for building refurbishment and exterior installations. CC meets the requirements of EN 12467 (Fibre-Reinforced Cement Boards for Wall Cladding).

## Other CC Applications

Other applications for CC include, Roofing, Retaining Walls, Scour Protection, Blinding Layers, Shotcrete Replacement, Curb Repair, Weed Inhibiting, Basements Lining, Water Tanks, Flood Defences, Tunnel Lining...

If you have ideas for new applications for CC, please contact info@concretecanvas.co.uk

## 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/m2) | Density (unset) (kg/m3) | Density (set) (kg/m3) |
|---|---|---|---|
| CC5 | 7.0 | 1500 | +30-35% |
| CC8 | 12.0 | 1500 | +30-35% |
| CC13 | 19.0 | 1500 | +30-35% |

## Setting

| | |
|---|---|
| Initial Set | ≥ 120 min. |
| Final Set | ≤ 240 min. |

## Method of Hydration

Concrete Cloth (CC) can be hydrated using saline or non saline water. The minimum ratio of water:CC is 1:2 by weight. CC cannot be over hydrated, an excess of water is always recommended.

Spray the fibre surface multiple times until the CC is saturated. The wet CC will first darken and then become lighter as it absorbs the water. CC is saturated when water pools on the surface or runs off.

CC should be re-wet at least once, between 1 and 2 hours after the initial hydration. This is essential in hot/arid environments, where evaporation can cause over-drying.

**CC5 is the most prone to over-drying and must always be re-wet one or more times after 1 to 2 hours regardless of climate.**

Do not use a jet of high pressure water directly onto the surface as this may wash a channel in the material.

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.

CC can also be used underwater, it will hydrate fully from immersion.

## Reaction to Fire

CC has achieved Euroclass B certification:

| | |
|---|---|
| BS EN 13501-1:2007+A1:2009 | B-s1, d0 |

*Indicative values

## Strength / Hardness

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

| | |
|---|---|
| Compressive testing 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 |
| Abrasion Resistance (DIN 52108) | |
| - Similar to wear resistant ceramic - 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

European Patent Application No 09001199
European Patent Application No 07732819.2
(Publication Number 2027319)