

**CONCRETE
CANVAS™**

Turkish Distributor



BETON KUMAŞ®

Front Line Protection

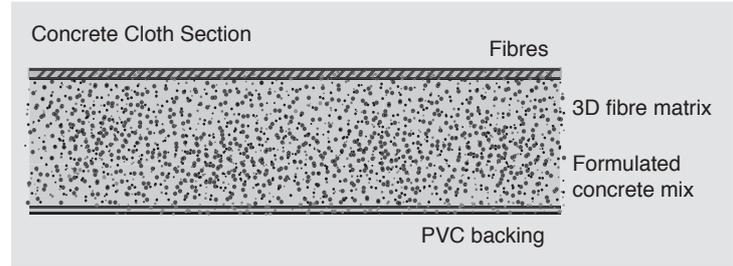
BETON KUMAŞ®

Concrete Cloth™

Concrete Cloth (CC) is a unique proprietary material that has been developed by Concrete Canvas Ltd. It has a very wide range of applications throughout the Defence and Construction industries.

By adding water, CC hardens to become a strong, durable, water proof and fire proof concrete surface. Due to recent developments, sea water may now be used to hydrate CC.

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, while hydrophilic fibres on the opposite surface aid hydration by drawing water into the cement. The material can be hydrated either by spraying or by being fully immersed in water. Once hydrated the material remains flexible and workable for 2 hours. It can be easily nailed, stapled through or coated with an adhesive for easy attachment to other surfaces. Once set, the fibres reinforce the concrete, preventing crack propagation and providing a safe plastic failure mode.



CC Key Facts

Rapid

After hydration, CC remains workable for 2 hours and hardens to 80% strength within 24 hours. Fast setting variants are currently being developed.

Easy To Use

Dry CC can be cut or tailored using simple hand tools.

Flexible

CC has good drape characteristics allowing it to take up the shape of complex surfaces including those with a double curvature.

Strong

The fibre reinforcement acts to prevent cracking, absorb energy from impacts and to provide 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.

Adaptable

CC is currently supplied on 1.1m wide rolls. There are 3 variants available as standard: CC4, CC8 and CC13, which are 5, 8 and 13mm thick respectively. CC can be manufactured up to 20mm thick.

Fire Proof

CC is a ceramic and will not burn.



CC Applications

Gabion Defences



Methods of Attachment



Pneumatic Hog ringing

Pigtail Fixing

Wire Fixing

CC can be used to repair damaged and unstable gabion walls to provide long-term protection. CC can also be used to upgrade new or existing structures to provide a durable solution that will last for decades. It can be rapidly applied by hand with no specialist equipment.

CC is delivered in man portable lengths that are easily fixed to the gabion structures. Once hydrated, CC hardens to form a strong, durable, fire proof surface that protects and holds the structure together.

Features

- ① **Prevents loss of fill** if the geotextile is damaged by UV degradation, weathering, vandalism and/or enemy fire.
- ② **Securely ties together** multi level gabion walls preventing movement.
- ③ **Prevents water ingress** which causes the fill to slump due to water saturation and the migration of fines.
- ④ **Gabions can be capped** with CC to prevent the fill being blown by wind or rotor wash.
- ⑤ **Can be painted** to improve the appearance of gabions.

Ditch Lining



CC can be unrolled rapidly to form a hardened, water proof concrete ditch or tank. It will conform to a range of ditch profiles and curves and requires no specialist plant equipment. Joints can be sealed to withstand over 3m of water pressure.

Sandbag Defences

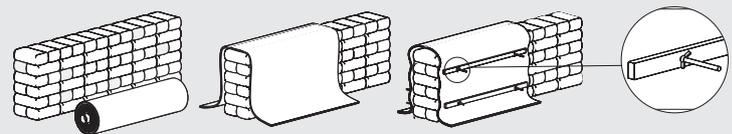


Sandbag wall after 800 rounds

CC Sandbag wall after 800 rounds



The British Army is using CC to upgrade frontline sandbag defences in Afghanistan. The cloth has been proven to prevent the degradation of sandbags from sustained incoming fire, outgoing muzzle flash and environmental exposure. A sandbag wall protected by CC easily withstood 800 rounds of 7.62 NATO, fired by a GPMG LR at a range of 100m. The wall showed little damage and negligible loss of fill. An identical unprotected sandbag wall was comprehensively destroyed in the same test. Similar field tests conducted by the British Army in Afghanistan led to an order for 5500sqm for use in Forward Operating Bases.



CC can be used by frontline troops to rapidly upgrade any sandbag structure without specialist equipment.

Ground Surfacing / Dust Suppression



CC can be secured with ground anchors to create a concrete surface. CC4 can be used for dust suppression and the thicker CC8 and CC13 for helicopter landing areas and track surfacing.

Concrete Cloth Material Data

Physical Properties

CC	Thickness (mm)	Batch Roll Size (sqm)	Bulk Roll Size (sqm)	Roll Width (m)
CC4	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)
CC4	8.0	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 woven 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.

CC4 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.

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

Impact Testing based on ASTM G13 Passed

Abrasion Resistance (ASTM C1353-8)
- CC lost 60% less weight than marble over 1000 cycles.

MOHS hardness 4-5

Reaction to Fire

CC has achieved Euroclass B certification:

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

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)

Concrete Canvas Shelters

CC is the base material for Concrete Canvas Shelters; rapidly deployable hardened shelters that require only water and air for construction. The 25sqm variant can be deployed by 2 people without any training in under 1 hour and is ready to use in under 24 hours.

