



CCX® FREQUENTLY ASKED QUESTIONS



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UTILITIES



DEFENCE



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SHELTER

CCX[®] GCCMs:

What is CCX[®]?

CCX[®] is part of a revolutionary new class of construction materials called Geosynthetic Cementitious Composite Mats (GCCMs). It is a flexible, concrete filled geosynthetic which hardens on hydration to form a thin, durable, waterproof and lower carbon alternative to conventional concrete. Essentially, it's *Concrete on a Roll*[®].

How does CCX[®] work?

CCX[®] is unrolled into position and secured in place. The material is then hydrated. There is a 30 minute working window before setting begins, and in 24 hours the material hardens to in-service performance specifications.

How is CCX[®] manufactured?

CCX[®] is manufactured in our UK production plant using bespoke machinery designed by Concrete Canvas Ltd. The process uses a unique patented method of inserting a cementitious material between two geosynthetic layers and stitched together to form a GCCM. For some CCX[®] product variants (discussed below), a LLDPE backing is applied to the bottom geotextile.

What is the lifespan of properly installed CCX[®]?

Based on environmental exposure testing, CCX[®] has a lifespan in excess of 50 years. For advice on specific climates, chemical conditions and applications please contact Concrete Canvas Ltd.

CCX-UTILITY[®] (CCX-U[®]) GCCM:

What is CCX-U[®]?

CCX-U[®] is the core CCX[®] GCCM material with geotextile top and bottom layers, but no LLDPE backing. This increases the flexibility of the GCCM but increases its permeability, making the product more suitable for use on contoured surfaces where permeability is less critical, such as some slope protection applications.

What applications is CCX-U[®] currently used for?

Whilst unsuitable for hydraulic applications such as channels, it may be used to line uniformly profiled slopes where erosion protection is required to counteract wind or rain acting directly on the slope only. CCX-U[®] may also be used to protect geomembrane liners.

CCX-MAT[®] (CCX-M[®]) GCCM:

What is CCX-M[®]?

CCX-M[®] is a variant of CCX[®] with a 0.3mm LLDPE geomembrane backing that ensures the material has very low permeability. The composite concrete top cover provides a high degree of long-term durability. As a result, CCX-M[®] is the ideal solution for the lining and remediation of channels and irrigation canals, increasing their operational life and reducing water seepage losses.

How does the CCX-M[®] GCCM differ from the Concrete Canvas[®] (CC) GCCM?

CCX[®] is slightly stiffer than CC, making it more suitable for larger more uniform profiles. CCX[®] has different drape characteristics than CC, making it less suitable for undulating surfaces.

What applications is CCX-M[®] currently used for?

CCX-M[®] is typically used to replace conventional concrete for erosion control, remediation and enhancement of impermeability to canals and bulk water infrastructure.

How waterproof is CCX-M[®]?

The permeability of a CCX-M[®] lined structure can be adjusted by selecting an appropriate method for joining the material. Please see the [CCX[®] Jointing Guide](#) for more information.

Formats & Availability

In what formats is CCX[®] available?

CCX-U[®] is supplied in Bulk Rolls 1.95m wide by 50m long, with an area of 97.5m² per Bulk Roll. CCX-M[®] is supplied in Bulk Rolls 1.9m wide by 50m in length, with an area of 95m² per Bulk Roll. Bulk Rolls can be maneuvered using a forklift fitted with a pole attachment.

What are the weights of the different types of CCX[®]?

CCX[®] has typical nominal dry weights of 14.5 to 15.5kg/m².

Which countries are CCX[®] products currently used in?

Although CCX[®] is the newest product that Concrete Canvas Ltd has developed, the material has been installed in over 50 countries covering all 6 developed continents. CCX[®] is available through our Sales Partner Network, which currently covers over 100 countries around the world.

How should CCX[®] be stored prior to use?

CCX[®] should be stored under cover in dry conditions, away from direct sunlight and within the manufacturer's sealed packaging as supplied.

What is the shelf life of properly stored CCX[®]?

When stored in the manufacturer's packaging in the correct conditions, CCX[®] can be kept for up to 18 months from the manufacture date without significant degradation in performance.

What is the shelf life after opening CCX[®]?

The performance values of CCX[®] will start to decline once opened, especially in humid environments. The CCX[®] should, therefore, be used within a few days of opening to prevent any significant degradation. It is best practice to reseal after opening if delays in installation are anticipated.

Can I order different lengths of material other than the Bulk Roll lengths?

Yes, bespoke lengths between 25m and 50m can be supplied and may be subject to a batching surcharge. Bespoke lengths are made to order and lead times may be longer than 50m stock

roll lengths and reduce shipping efficiencies.

Where can I buy ancillary CCX[®] installation products?

Concrete Canvas Ltd can supply a range of ancillary products for CCX[®] installations including ground pegs, screws and sealant.

Where can I buy ancillary installation equipment?

Concrete Canvas Ltd can supply a range of ancillary installation equipment for CCX[®] installations including autofeed screwdrivers, spreader beams and thermal welding equipment.

Does Concrete Canvas Ltd have international distributors?

Yes. See the map on the [Contact Us page](#) on our website for details of who to contact to find your nearest distributor.

Are samples of CCX[®] available?

Yes. Concrete Canvas Ltd can supply small and large sample packs on request, which contain hardened swatches and unset A4 samples. Due to the volume of requests for sample packs, a postage fee will apply.

What is the price of CCX[®]?

The price of CCX[®] is volume dependent. Contact your local Concrete Canvas Ltd rep or distributor for a quote specific to your requirements and delivery location.

Designing with CCX[®]

What Type of GCCM is CCX[®]?

CCX-U[®] and CCX-M[®] have been independently tested to the performance properties listed in ASTM D8364 - Standard Specification for GCCM Materials. Both products meet the minimum requirements of a Type II GCCM. Please see [Technical Note 1](#) for more information on ASTM D8364.

What are the methods for joining layers of CCX[®] together?

The three most common methods for jointing CCX-U[®] and CCX-M[®] are a screwed overlap joint; a screwed and sealed overlap joint; or a thermally bonded and screwed overlap joint. Please see [CCX[®] Jointing Guide](#) or contact Concrete Canvas Ltd for more details.

Is there a maximum inclination that CCX[®] can be installed onto?

CCX[®] can be installed vertically providing that the supporting surface is structurally stable. Contact Concrete Canvas Ltd for assessment of the intermediate fixings required to ensure the performance of the lining in steeply inclined applications.

At what intervals should CCX[®] be pegged down?

This is dependent on the application and the quality/ inclination of the substrate; as a guide, we recommend pegging in anchor trenches at 2m intervals and material overlaps (joints). For large structures with more than 3m profile lengths, temporary ballasting is required after hydration. Wind or hydraulic shear forces may also require additional anchoring to prevent movement of the CCX[®]. Consult the [CCX[®] Specification Guides](#)

for more information.

How does CCX[®] compare environmentally with conventional poured concrete ditch lining?

CCX[®] typically replaces 100-150mm of poured, sprayed or precast concrete, resulting in typical material savings of 90%. This directly results in a reduction of the carbon footprint of construction works.

What level of chemical resistance does CCX[®] provide?

CCX[®] has excellent resistance to hydrocarbons, alkalines and leachates. Please contact us with your chemical information to allow us to advise on CCX[®] compatibility for your application.

Installing CCX[®]

Is it possible to lay CCX[®] in wet conditions?

Only under well coordinated installations should CCX[®] be installed in the rain or wet. Once wet, CCX[®] has a working time of approximately 30 minutes in a UK climate. When thermal bond and screwed joints are specified, installation must be in dry conditions.

Is it possible to lay CCX[®] in very cold conditions?

Yes. Consult the [CCX[®] - Hydration Guide](#) for further instruction and contact Concrete Canvas Ltd directly for extreme conditions.

Are there any special precautions to take when laying CCX[®] in very hot conditions?

Yes. Wherever possible it is advised to hydrate CCX[®] at dusk to avoid the water used for hydration evaporating in warm environments. In very hot conditions, Consult the [CCX[®] - Hydration Guide](#) for further instruction and contact Concrete Canvas Ltd directly for extreme conditions.

How can I cut CCX[®]?

Before hydrating, unset CCX[®] can be cut using basic hand tools. It is recommended to use a utility knife or handheld self-sharpening powered disc cutters. After CCX[®] has set, it can be cut using angle grinders, jigsaws with ceramic blades or good quality tile cutters.

Is it possible to over-hydrate CCX[®]?

One of the key features of CCX[®] is that the fixed internal volume and control during manufacture ensures void space is set within carefully prescribed bounds and subsequently limits the Water: Cement ratio achieved in the field. It is therefore not possible to over hydrate CCX[®]; it will set underwater.

What happens if CCX[®] is under-hydrated?

The CCX[®] will not reach its full strength and the setting time may be delayed.

Will CCX[®] set underwater?

Yes. It will hydrate fully from immersion.

What water should be used to hydrate CCX[®]?

CCX[®] must be actively hydrated. For example do not rely on rainfall or snowmelt. Raw water may be used, but must be above pH 6.

How much water per m² of CCX[®] should be used for hydration?

The minimum ratio of water: CCX[®] is 50% by weight. CCX[®] weighs approximately 15kg/m² so a minimum of 7.5 litres/m² is required for hydration. CCX[®] cannot be over hydrated so an excess of water is always recommended.

What Health and Safety precautions should I take when handling CCX[®]?

General PPE precautions should be taken; face masks, protective clothing and gloves should be worn when handling CCX[®]. Consult the [CCX[®] \(M\)SDS](#) document for more information.

Should CCX-M[®] be laid fibre or LLDPE surface facing upwards?

CCX[®] should be installed with the fibrous polyester surface with zigzag stitching exposed. The fibre reinforced concrete layer will protect the LLDPE backing from weathering and UV damage.

Does CCX[®] require any post-installation maintenance?

CCX[®] should be inspected 24hours after hydration. Providing it is installed correctly, CCX[®] requires no regular post- installation maintenance. Consult the [CC User Guide: Inspection, Cleaning and Maintenance](#) for more information.

How should CCX[®] be disposed of or demolished?

CCX[®] can be demolished using standard construction demolition equipment and disposed of in the same manner as conventional concrete waste. The EWC code for CCX[®] is 20 03 01.