



CCX™ FREQUENTLY ASKED QUESTIONS



RAIL



ROAD



MINING



PETROCHEM



AGRO



PUBLIC WORKS



UTILITIES



DEFENCE



DESIGN



SHELTER

CCX-MAT™ (CCX-M™) GCCM:

What is CCX-M™ GCCM?

CCX-M™ 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-M™ work?

CCX-M™ 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 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 is CCX-M™ manufactured?

CCX-M™ 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. A 0.3mm LLDPE backing is applied to the bottom geosynthetic.

What is the lifespan of properly installed CCX-M?

Based on environmental exposure testing, CCX-M™ has a lifespan in excess of 50 years. For advice on specific climates and applications please contact Concrete Canvas Ltd.

CCX-B™ GCCB *coming soon*:

What is CCX-B™ GCCB?

CCX-B™ is part of a revolutionary new class of construction materials called Geosynthetic Cementitious Composite Barriers (GCCBs). CCX-B™ combines the concrete - filled geotextile technology of CCX™ with a highly impermeable, chemically resistant, minimum 1mm thick LLDPE geomembrane backing that can be thermally welded with conventional welding equipment to create a certifiably impermeable joint.

How does CCX-B™ work?

CCX-B™ can be laid either transversely or longitudinally to create an all in one, durable and impermeable lining solution. The LLDPE geomembrane liner is separated at the edges from the cement filled geotextile layers above. This separation allows for the cement filled layer to be folded back, exposing the LLDPE geomembrane. The exposed LLDPE geomembrane can be thermally welded along the overlaps to create a certifiably impermeable joint. The flexible concrete-filled geosynthetic

hardens on hydration, to provide long term protection to the geomembrane from puncture, abrasion, weathering and UV degradation. This hard armor concrete surface effectively removes the need for concrete, soil or aggregate top cover, normally required with conventional liner systems.

How does the CCX-B™ GCCB differ from the CC Hydro™ GCCB?

CCX™ has a LLDPE backing whilst CC Hydro™ has a PVC backing. CC Hydro™ has a greater spectrum of chemical resistance than CCX-B™ which is used more commonly in clean water applications.

What applications is it currently used for?

CCX-B™ is typically used to replace combined geomembrane and concrete cover solutions for irrigation, drainage, hydroelectric and navigable canals along with other bulk water infrastructure applications.

What is the lifespan of properly installed CCX-B?

CCX-B has been tested for impermeability, UV, freeze-thaw and chemical durability to ISO standards. For bulk water infrastructure projects a lifespan in excess of 50 years is expected. For advice on specific climates please contact Concrete Canvas Ltd.

Formats & Availability

In what formats are CCX-M™ and CCX-B™ available?

CCX-M™ and CCX-B™ are supplied as Bulk Rolls 1.9m wide by 50m in length, with an area of 95m² per Bulk Roll. Bulk Rolls are supplied with slings and can also be maneuvered using a forklift fitted with a pole attachment.

What are the weights of the different types of CCX?

CCX-M™ and CCX-B™ have 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 20 countries covering all 6 developed continents. CCX™ is available through our Sales Partner Network, which currently covers over 80 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 12 months from the manufacture date without significant degradation in performance. After the 12-month point, CCX™ will continue to function but may take longer to reach the values specified on the [CCX Data Sheet](#).

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.

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-M™ and CCX-B™?

The price of CCX-M™ and CCX-B™ 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-M™ and CCX-B™ 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-M™ are a screwed overlap joint; a screwed and sealed overlap joint; or a thermally bonded and screwed overlap joint. For CCX-B™ the geomembrane layers must be thermally welded together whilst the cement filled geotextile layers can be thermally bonded or sealed with an adhesive sealant. Please see [CCX™ Jointing Guide](#) or contact Concrete Canvas Ltd for more details.

How waterproof is CCX-M™?

The enhancement of impermeability 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.

If the overall impermeability is critical for your application, we

would recommend the use of CCX-B™, which is thermally welded with testable joints for quality assured containment applications.

How Waterproof is CCX-B™?

The level of waterproofing that materials provide is typically referred to in geotechnics using a measure of permeability called the k-value. The LLDPE geomembrane to CCX-B™ has been tested to BS EN 14150 and has a k value of the less than 1×10^{-12} m/s

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). In warm climate conditions, intermediate fixings are required at a maximum of 3m intervals on exposed CCX-M™ surfaces. Wind or hydraulic shear forces may also require pegging to prevent movement of the CCX™. Consult the [CC Specification Guide: Watercourses](#) for more information and for advice on non-penetrative fixings for CCX-B™, contact Concrete Canvas Ltd.

How does CCX™ compare environmentally with conventional poured concrete ditch lining?

CCX-M™ 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. CCX-B™ typically replaces 100-150m of poured concrete over a geomembrane liner.

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. CCX-B™ must be dry to enable thermal welding of joints.

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 CCXTM?

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

Is it possible to over-hydrate CCXTM?

One of the key features of CCXTM 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 CCXTM; it will set underwater.

What happens if CCXTM is under-hydrated?

The CCXTM will not reach its full strength and the setting time may be delayed.

Will CCXTM set underwater?

Yes. It will hydrate fully from immersion.

What water should be used to hydrate CCXTM?

CCXTM can be hydrated using non-saline water. The water does not need to be potable but should be fresh water with a pH >6 and <8.

How much water per m² of CCXTM should be used for hydration?

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

What Health and Safety precautions should I take when handling CC?

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

Should CCXTM be laid fibre or LLDPE surface facing upwards?

CCXTM 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 CCXTM require any post-installation maintenance?

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

How should CCXTM be disposed of or demolished?

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