

# **STUDY OF CONCRETE CLOTH (CC) IN CIVIL ENGINEERING CONSTRUCTIONS WORKS**

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## **ABSTRACT**

*Concrete cloth or concrete canvas is the most up-to-date fabric material in construction along worldwide. CC is the flexible material due to this advantage, the use of cc is rapidly extended. The speed of work and price to attract the all civil engineers as supplemented by using production cloth in constructions. This cloth is used for transient motive like canal lining and to prevent the soil erosion in hilly regions and so forth. Life span of cc is 15 to 20 years. In this paper to take a look at the applications and engineering properties of concrete cloth. CC is a ceramic nature has fire resistant and water proof.*

**Keywords :** *Concrete cloth, Dry concrete mix. Flexible, Fire resistant, Water proof*

## **I. INTRODUCTION**

Concrete is a freshly blended material, which may be moulded into required shape. There are many advantages of concrete, however there's one downside is that, it isn't flexible, while it is hardened. To conquer through this disadvantage of concrete. A new introduction material become evolved with the aid of British Engineering Company referred to as Concrete Canvas or concrete cloth(CC). Concrete cloth (CC) is a unique proprietary material. It has a totally large variety of packages at some point of the building & civil engineering enterprise. Concrete cloth is a flexible; cement impregnated fabric that hardens when hydrated to form a thin, durable, water & fire proof concrete layer. CC lets in concrete production without the want for plant or mixing system. Simply function the canvas & really add water. CC has a design life of above 10 years and is considerably quicker and much less expensive to install in comparison to standard concrete.

CC includes a 3- dimensional fiber matrix containing a specifically formulated dry Concrete mix. A PVC backing on one floor of the cloth guarantees the cloth is absolutely water-evidence, at the identical time as hydrophilic fibers (Polyethylene and Polypropylene yarns) on the opposite surface resource hydration with the useful resource of drawing water into the aggregate. The material can be hydrated either by way of using spraying or by being clearly immersed in water. It may be effortlessly nailed, stapled through or covered with an adhesive for smooth attachment to different surfaces. Once set, the fibers fortify the concrete, stopping crack propagation & imparting a secure plastic failure mode. CC is to be had in three-thicknesses; CC5, CC8 & CC13, which can be five, eight & thirteen mm thick respectively.

## **II. HISTORY OF CC**

The technology of concrete cloth was found for the use of emergency shelters. This technology wasn't commercialized for other works. Later researches were made on concrete cloth and incredible product was introduced to construction field. The concept of concrete cloth was first proposed by Brewen and Crawford in 2005. Later the research was conducted and the British Engineering Company found the Revolutionary material

### **III. STRENGTH PROPERTIES**

#### **Compression test on CC**

Compressive strength test on concrete cloth is based on ASTM C473 part 07

7<sup>th</sup> day compressive strength = 38MPa

10<sup>th</sup> day compressive strength = 40MPa

Young's modulus = 500MPa.

#### **Bending Test on CC**

The 7-day minimum bending stress = 3.3MPa. And Bending modulus = 180MPa.

#### **Abrasive Resistance Test on CC**

The resistance exerted by the body for abrasive action is abrasion resistance. As per ASTM C1353 part 8, the standard method used to calculate a materials abrasive resistance, concrete cloth lost 60% less weight than that of marble over 2000 repeated cycles

### **IV. PHYSICAL PROPERTIES**

#### **Thickness:**

CC type	Thickness (mm)	Width (mm)
CC5	5	1000
CC8	8	1100
CC13	13	1100

#### **Setting Time:**

Concrete cloth can acquire 70 to 80% of its strength in 24 hours of hydration.

Initial setting time	≥ 120 min
Final setting time	≥ 240 min

#### **Density:**

Before hydration	1500 kg/m <sup>3</sup>
After hydration	1952-2050 m <sup>3</sup>

### **V. ADVANTAGES**

#### **Portable:**

They are easy to carry, transport and deployed without specialized equipment.

#### **Easy to use:**

Dry concrete fabric may be reduce or tailor-made the usage of simple hand tools. It may be effortlessly repaired or upgraded the usage of existing cement products.

#### **Flexible:**

**Strong:**

The fiber reinforcement acts to save the cracking, absorbs energy from affects and affords a solid failure mode

**Waterproof:**

The PVC backing on one floor guarantees that concrete cloth is completely water resistant.

**Hydration:**

Hydration takes place by way of filling the sack with water. Hydration is aided through the fiber matrix, which facilitates water into the cement.

**Setting:**

The concrete cloth cures in the shape of the below structure on which it is placed and 24 hours later the structure is ready to use.

**Adaptable:**

Concrete cloth is currently supplied on 1.2m-wide rolls but can be manufactured with a roll width of up to 5m. The cloth can be produced in a range of thicknesses from 5–20mm.

**Durable:**

The Concrete cloth is chemically resistant and will not degrade in UV.

**Fireproof:**

The Concrete cloth is a ceramic-based material and will not burn.

**Rapid:**

The cloth may be hydrated with the aid of either spraying it or absolutely immersing it in water. Once hydrated, it remains possible for two hours and hardens to 80% of its final power within 24 hours. These instances can be decreased by including accelerants into the dry aggregate on the point of manufacture.

## **VI. APPLICATIONS**

### **Concrete Cloth for slope protection**

The slopes of dams, roads, embankments are normally hooked up with truffing to shield it from soil erosion, reduction of shear strength caused by many elements, however the renovation price of truffing is greater. Concrete fabric is used on slopes for slope stabilization, erosion manage for both permanent and transient slope safety.

### **Concrete Cloth in Ditching**

Ditches are used for water channels or waste water can be coated with concrete cloth, which protects the water seeping from ditches. Its brief and much less costly to install in comparison to the traditional manner of ditching.

### **Concrete Cloth in Pipe Protection**

Overland and underwater pipelines typically go through corrosion or direct impacts. To triumph over these, concrete material can be used as a coating for pipes which provide protection towards corrosion and influences. It affords superior tough shield.

### **Mining Applications of Concrete Cloth**

The inner floor of the mine is to be blanketed from listening and breaking. At this locations generally sprayed



concrete is used. By using concrete material at mines, the price can be reduced by 20% when compared to sprayed concrete.

## Dust Suspension by Using Concrete Cloths

One of the makes use of of concrete material is in defense quarter is that it is able to be used because the dust suspension. Places like helipad, due to turbulent air contemporary created through helicopter rotor, the free soil debris are washed up into the air. This could negatively have an effect on humans, flora and fauna and machines. This concrete material can be used around helipad which controls the bathing up of free soil.

## V. CONCLUSION

The study shows that it's a good material for use at temporary as well as permanent purposes in Tunnel Lining, Water proofing, and dust suspension and from the economical point of view Concrete Canvas/cloth is a good alternate product of concrete. It is very easily to place & handle. It is highly fire resistant and water proof material. CC is made by without help of plant or mixing equipment.

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