



Technological Highlight

July 2021

CCI's Ready-made Solution for the Carbon Fibre Composite Market

Highlight: Carbon Fibre Composite Sample

Solutions: IN THE STUDIO solution

Industry: Functional & Technical Fabric Industries

Products: Evergreen II 500 for carbon fibre (Weaving)
SW550 for carbon fibre (Warping)

[Market Challenges]

Carbon fiber is playing an increasingly important part in making technical fabrics because it is a very strong and lightweight material. The carbon fiber composite is most often used in many markets like aircraft & aerospace, energy, automotive, civil engineering, military, and other industrial applications. To address the growing market needs, there are production loom and related equipment especially for the manufacturing of this specific application. However, when the technical fabrics are still in the design stage, choosing traditional method to produce sample will be a very expensive investment, not to mention the efficiency of business operation. In particular, carbon fiber has the characteristics of non-twist and multi-filament, which is more difficult to handle than conventional yarns.

CCI understands the R&D could be harder than normal and has developed a total sampling solution for advanced composite. Our solution integrates high-efficient weaving and warping machines with specially designed auxiliary attachments, delivering a more economical, effective and easy way for making sample. Your design concept can be easily transformed into a real woven carbon sample anytime. See how we can help reduce waste and create an eye-catching composite fabric sample in a relatively short time scale.



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[CCI Sampling Solution]

The sampling solution for carbon fibre composite includes a **Positive Creel**, **Mini Warper (SW550)** with **Carbon Dust-proof Design**, and **Sampling Loom (Evergreen II 500)** with **Positive Gripper & Carbon Dust-proof Design**.



Non-twist warping

The Mini Warper, SW550, is specially developed to be used with sampling loom. It utilizes a touch-panel computer to control shifting movement on the drum for winding the warp yarn in its required position to produce a short-run warp beam for sample. It is a very easy-to-use warping machine that consumes minimal yarn materials and labors. When the warp beam of carbon fiber yarn is finished by SW550, it's time to load it on the Sampling Loom, Evergreen II 500. The machine's co-ordination of all

movements is computerized with separate motor controlled modules, allowing more accurate weaving operation for high-quality composite sample. To work with SW550, Evergreen II 500 is capable of finishing sample in size of 500 mm in width. The combination of the machines is perfectly ideal for producing most types of carbon fibre composite based on your design.

1. Non-twist Unwinding with Positive Creel

The sideway withdrawal of carbon fibre yarn ensures unwinding without changing the nature of twist. It must be performed on the positive creel which features an unwinding motor synchronized with the machines.

- **Non-twist Warping**

The warping without twisting warp yarn requires sideway withdrawal from positive creel to mini warper (SW550).

- **Non-twist Weaving**

The weaving without twisting weft yarn requires sideway withdrawal from positive creel to sampling loom (Evergreen II).



Non-twist weaving

2. Positive Gripper

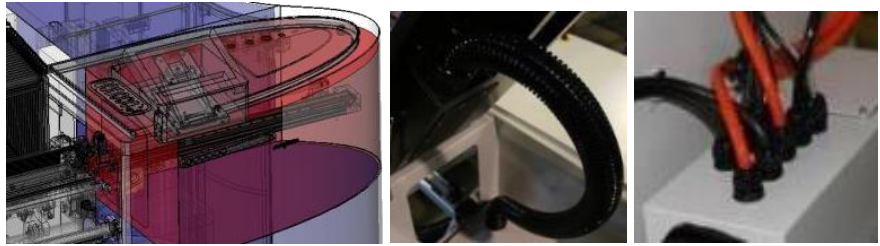
The positive gripper on sampling loom (Evergreen II) can help accurately catch multi-filament yarn of carbon fibre.



Positive gripper

3. Dust-proof Design

The carbon fibre dust could damage the electronics of machine, and therefore it's crucial and necessary to provide dust-proof seal for touch panel computer, controller, connectors & tubes, and more components.



Dust-proof protection

[Results]

Our machines worked together to make a carbon fiber cloth sample in width of 500 mm and length of 1.6 m, with specifications of plain weave, 12k, in warp density of 10 ends/inch and weft density of 10 picks/inch. In addition, more specifications can be made with ease. Composite technology is



Carbon fibre composite sample finished

becoming more popular, and that means you need an efficient method capable of developing complex carbon fiber cloth with high productivity and quality. CCI's sampling solution is the answer. Most importantly, our solution features downsized dimensions. Whether you are an R&D center or a workshop, or you have space constraints, these machines can easily fit any space. Contact CCI now at info@ccitk.com for more details.

[Machines Used]

Evergreen II 500 | Sampling Loom for carbon fibre

Quick Facts:

- Weaving Speed: 40 ppm
- Weaving Length: 1.6 m
- Weaving Width: 500 mm
- Weaving Time: 30 min



SW550 | Mini Warper for carbon fibre

Quick Facts:

- Warping Speed: 20 m/min
- Warping Length: 1.6 m
- Number of Bobbins Required: 1
- Warping Time: 30 min



Optional Warp Creel for carbon fiber

Quick Facts:

- Alternative of SW550 (mini warper) for longer fabric
- Capable of directly delivering carbon fiber yarn to Evergreen II (sampling loom) as warp for weaving



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