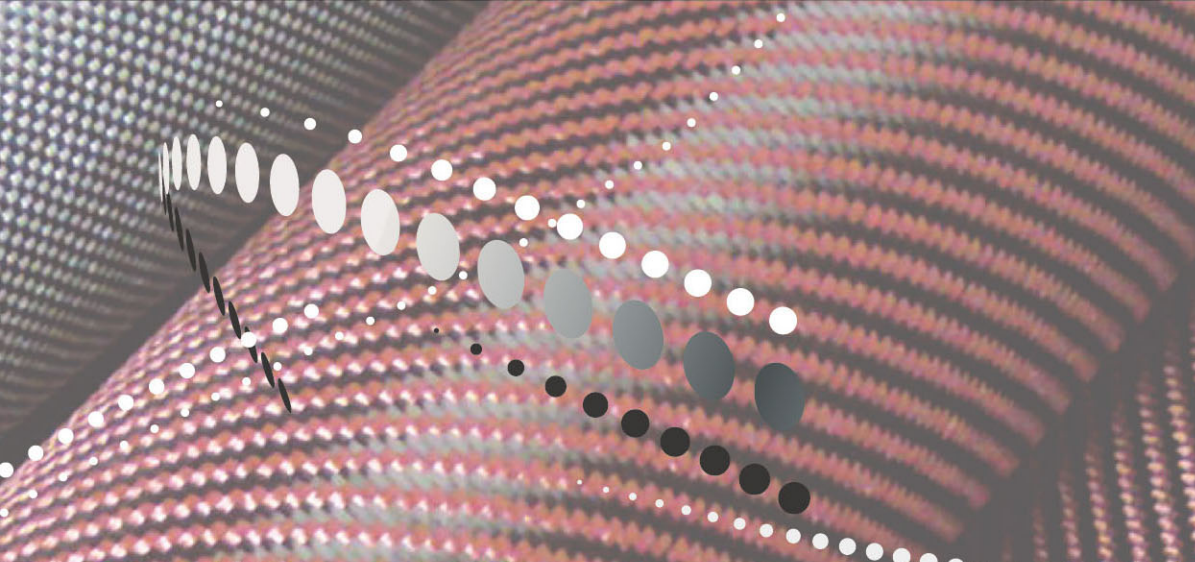




# CARBON FIBER FABRICS



FORMOSA TAFFETA CO., LTD.



# 福懋興業股份有限公司簡介

福懋興業股份有限公司於1973年設立於台灣。福懋公司為台塑之關係企業，長期以來“織布”一直是福懋之本業與專業項目，從雨傘布，各式功能性衣著用布到輪胎簾布與防彈、防火之生命安全用布，福懋本著“品質至上”與“服務客戶”之經營理念，不但受到國內外業界之肯定，更始終能在同業中取得領導之地位。今天福懋在專業領域上已經是Nike、Adidas與Dupont等知名公司的生意夥伴。

FORMOSA TAFFETA CO., LTD. (FTC) was founded in 1973 Taiwan. It is a member of the Formosa Plastic Group. FTC involves the textile product manufacturing and has been an expert in weaving umbrella fabric, high technology performance clothing fabric, tyre cord and the life protective fabric of bullet and fire. FTC also becomes the leader in the textile weaving field as continuously sets up the advanced machinery and is reputed as "best quality" and "customer first". Now FTC is an important partner with the Nike, Adidas and Dupont for the international business.

## 一、纖維特性

1. 碳纖維：◎纖維密度 $1.80 \text{ g/cm}^3$  ◎樹脂結合性佳 ◎比强度高 ◎比剛性高  
◎良好之導電性與導熱性 ◎具電磁波屏蔽與X射線穿透性
2. 玻璃纖維：◎纖維密度 $2.54 \text{ g/cm}^3$  ◎價格便宜 ◎耐衝擊性佳 ◎電器絕緣性佳
3. 克維拉纖維：◎避震性佳 ◎耐衝擊性佳 ◎輕而強韌 ◎密度 $1.44 \text{ g/cm}^3$

## 二、碳纖維與混成織物之應用

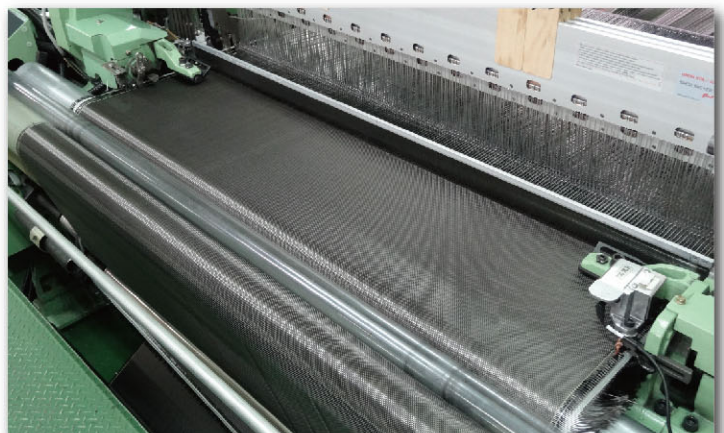
1. 工業用途：機械手臂及機件、樑柱補強、風力葉片、醫療器材、汽車與高速車體等。
2. 船舶遊艇：船舶遊艇之船體及結構、遊艇內裝、儀表板等。
3. 3C產品：Note-book與手機之機殼。
4. 運動休閒產業：自行車、運動鞋、曲棍球桿與滑雪器具等。

### 1. The fiber specification

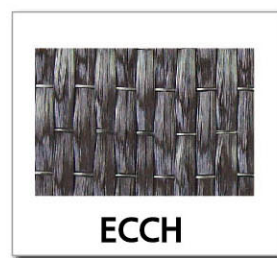
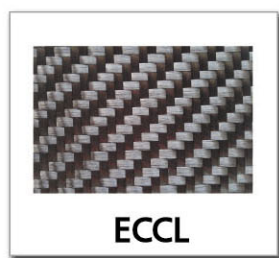
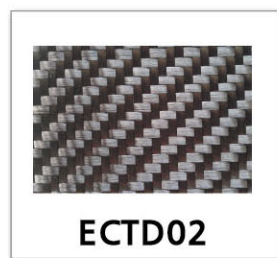
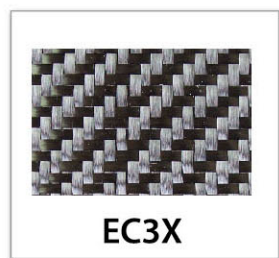
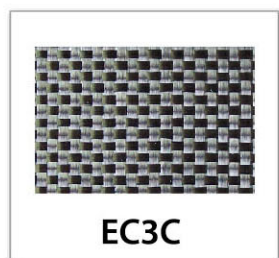
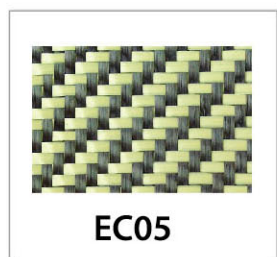
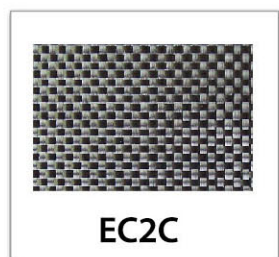
1. The fiber specification 1. Carbon fiber : density  $1.80 \text{ g/cm}^3$ , good adhesion with resin, higher specific strength, higher specific modulus, good heat and electric conductive, electromagnetic interference(EMI), and the penetration of X-ray.
2. Fiberglass: density  $2.54 \text{ g/cm}^3$ , cheaper, high impact, and electric insulation.
3. Kevlar: good vibration damping, high impact, tough and low density ( $1.44 \text{ g/cm}^3$ ).

### 2. The application of carbon fabric

1. Industry: Robot parts, civil reinforce, wind blade, Medical bed and the body of high-speed train
2. Ship: Hull structure, Ship parts, Yacht.
3. 3C products: Note book and mobile phone case.
4. Sporting goods: Bicycle parts, shoes, hockey, and skating parts.



## 2D WOVEN



| Product NO. | Warp Ends | Fill Picks | Warp Yarn |        | Fill Yarn |           | Weave     | Width (cm) | Thickness (mm) | Weight (g/m <sup>2</sup> ) |
|-------------|-----------|------------|-----------|--------|-----------|-----------|-----------|------------|----------------|----------------------------|
| EC2C        | 18        | 18         | 1.5K      | carbon | 1.5K      | carbon    | 1/1 Plain | 100        | 0.19           | 144.0                      |
| EC2D        | 18        | 18         | 1.5K      | carbon | 1.5K      | carbon    | 2/2 Twill | 100        | 0.19           | 144.0                      |
| EC01        | 13        | 13         | 3K        | carbon | 1500D     | Kevlar(Y) | 1/1 Plain | 100        | 0.27           | 190.8                      |
| EC05        | 13        | 13         | 3K        | carbon | 1500D     | Kevlar(Y) | 2/2 Twill | 100        | 0.28           | 190.8                      |
| EC3C        | 12.5      | 12.5       | 3K        | carbon | 3K        | carbon    | 1/1 Plain | 100        | 0.24           | 200.0                      |
| EC3X        | 13        | 13         | 3K        | carbon | 3K        | carbon    | 2/2 Twill | 100        | 0.25           | 208.0                      |
| ECTC02      | 12.5      | 12.5       | 3K        | carbon | 3K        | carbon    | 1/1 Plain | 100        | 0.33           | 200.0                      |
| ECTD02      | 12.5      | 12.5       | 3K        | carbon | 3K        | carbon    | 2/2 Twill | 100        | 0.33           | 200.0                      |
| EC3701      | 12.5      | 12.5       | 3K        | carbon | 3K        | carbon    | Diamond   | 100        | 0.28           | 200.0                      |
| EC3M        | 13        | 18         | 3K        | carbon | 3K        | carbon    | 2/2 Twill | 100        | 0.30           | 248.0                      |
| ECCM        | 6.25      | 6.25       | 12K       | carbon | 12K       | carbon    | 1/1 Plain | 100        | 0.52           | 400.0                      |
| ECCN        | 6.25      | 6.25       | 12K       | carbon | 12K       | carbon    | 2/2 Twill | 100        | 0.575          | 400.0                      |
| ECCK        | 9.375     | 9.375      | 12K       | carbon | 12K       | carbon    | 1/1 Plain | 100        | 0.65           | 600.0                      |
| ECCL        | 9.375     | 9.375      | 12K       | carbon | 12K       | carbon    | 2/2 Twill | 100        | 0.70           | 600.0                      |
| ECCF        | 6.5       | 4.5        | 12K       | carbon | 55tex     | glass     | 1/1 Plain | 50         | 0.28           | 217.9                      |
| ECCH        | 9.5       | 4.5        | 12K       | carbon | 55tex     | glass     | 1/1 Plain | 50         | 0.38           | 313.9                      |

\* 其他規格可依客戶需求製作。(Specifications can be customized base on request.)

## FTC Carbon Fiber Fabric Specification of Construction Reinforcement and Seismic Retrofit

| Uni-directional Fabric | Area Weight (g/m <sup>2</sup> ) | Width (cm) | Carbon Fiber Type | Packing (m/roll) | Design Thickness(cm) |
|------------------------|---------------------------------|------------|-------------------|------------------|----------------------|
| ECCF                   | 200                             | 50         | TC-36P-12K        | 100              | 0.0111               |
| ECCH                   | 300                             | 50         | TC-36P-12K        | 100              | 0.0166               |

### The Property of TAIRYFIL TC-36P-12K Carbon Fiber

| Item     | Tensile Strength |                      | Tensile Modulus |                      | Elongation | Density           |
|----------|------------------|----------------------|-----------------|----------------------|------------|-------------------|
| Unit     | MPa              | kgf/cm <sup>2</sup>  | GPa             | kgf/cm <sup>2</sup>  | %          | g/cm <sup>3</sup> |
| Property | 4900             | 4.99×10 <sup>4</sup> | 250             | 2.55×10 <sup>6</sup> | 2.0        | 1.80              |

## PREPREG

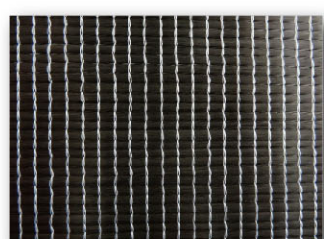
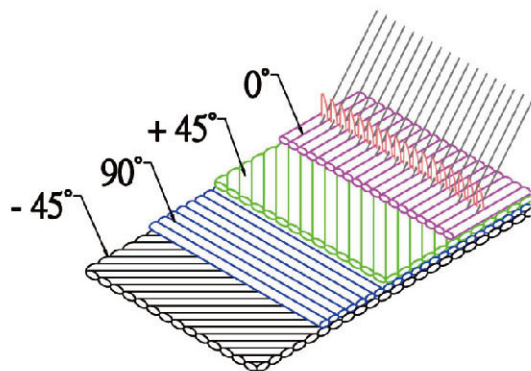


| Product | Weight (g/m <sup>2</sup> ) | RC%   | Tg °C   | Carbon Yarn | Width (cm) |
|---------|----------------------------|-------|---------|-------------|------------|
| UD      | 75                         | 30~40 | 120~250 | 12K         | 100        |
|         | 100                        | 30~40 | 120~250 | 12K         | 100        |
|         | 125                        | 30~40 | 120~250 | 12K         | 100        |
|         | 150                        | 30~40 | 120~250 | 12K         | 100        |
|         | 200                        | 30~40 | 120~250 | 12K/24K     | 100        |
|         | 250                        | 30~40 | 120~250 | 24K         | 100        |

| Fiber Type | Number of Filament | Yield Tex (g/1000m) | Tensile Strength | Tensile Modulus | Elongation (%) | Density (g/cm <sup>3</sup> ) |
|------------|--------------------|---------------------|------------------|-----------------|----------------|------------------------------|
|            |                    |                     | MPa              | GPa             |                |                              |
| TC-36P 12K | 12,000             | 800                 | 4900             | 250             | 2.0            | 1.80                         |
| TC-42S 12K | 12,000             | 440                 | 5690             | 290             | 2.0            | 1.81                         |
| TC-42S 24K | 24,000             | 800                 | 5690             | 290             | 2.0            | 1.81                         |
| T700SC 12K | 12,000             | 800                 | 4900             | 230             | 2.1            | 1.80                         |
| T700SC 24K | 24,000             | 1650                | 4900             | 230             | 2.1            | 1.80                         |

\* 其他規格可依客戶需求製作。(Specifications can be customized base on request.)

Multiaxial



| Product No. | Fiber Orientation      | Fiber Weight Per Layer (g/m <sup>2</sup> ) | Total Weight (g/m <sup>2</sup> ) | Width (cm) | Roll Length (m) |
|-------------|------------------------|--------------------------------------------|----------------------------------|------------|-----------------|
| ECMT01      | +45° / -45°            | 75                                         | 157                              | 127        | 50              |
| ECMT03      | +45° / 90° / -45°      | 75                                         | 232                              | 127        | 50              |
| ECMT06      | +45° / -45°            | 100                                        | 207                              | 127        | 50              |
| ECMT08      | +45° / 90° / -45°      | 100                                        | 307                              | 127        | 50              |
| ECMT11      | +45° / -45°            | 125                                        | 257                              | 127        | 50              |
| ECMT13      | +45° / 90° / -45°      | 125                                        | 382                              | 127        | 50              |
| ECMT16      | +45° / -45°            | 150                                        | 307                              | 127        | 50              |
| ECMT18      | +45° / 90° / -45°      | 150                                        | 457                              | 127        | 50              |
| ECMT21      | +45° / -45°            | 200                                        | 407                              | 127        | 50              |
| ECMT22      | 0° / 90°               | 200                                        | 407                              | 127        | 50              |
| ECMF23      | +45° / 90° / -45°      | 200                                        | 607                              | 127        | 30              |
| ECMF24      | 0° / +45° / -45°       | 200                                        | 607                              | 127        | 30              |
| ECMF25      | 0° / +45° / 90° / -45° | 200                                        | 807                              | 127        | 30              |
| ECMF36      | +45° / -45°            | 300                                        | 607                              | 127        | 30              |
| ECMF38      | +45° / 90° / -45°      | 300                                        | 907                              | 127        | 30              |

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