

# Advantages of Carbon Composites

---

Carbon fiber composites are extremely versatile. Vermont Composite's engineering team has the tools and experience to develop the optimal properties required for almost any application.

The properties of a carbon fiber composite structure depend on the selection of the components and how they are arranged. The two principal elements of a carbon composite structure are the matrix and the fibers.

Fiber can be individual strands or multiple strands braided. The selection of the fiber, its orientation and its layering play a dominant role in determining the characteristics of the finished structure.

The matrix serves to keep the fiber in the desired position. In addition, the matrix imparts important properties to the composite structure.

Certain ingredients may be added to the matrix during production that will provide additional desired properties.

The Vermont Composites engineering team has many years of experience in fiber, matrix, and ingredient selection to meet the performance requirements of the finished structure.

The following points highlight the principal advantages and characteristics of carbon fiber composites.

## **Strength / Light Weight:**

For the same strength, carbon composites are 80% lighter than steel and 60% lighter than aluminum.

## **Stiffness:**

Carbon composites exhibit higher stiffness to weight ratios than conventional materials.

## **Fatigue:**

Carbon Composites resist degradation in high fatigue applications much better than conventional materials.

## **Corrosion Resistance:**

Carbon composites are essentially inert even in corrosive environments.

## **Energy Dampening**

Carbon Composites can be constructed around foam cores that will enable tremendous vibration dampening characteristics

## **Thermal Expansion:**

This property can be tailored to match surrounding structures thereby minimizing thermal stress.

## **Energy Transmission:**

Carbon composites can be made to absorb or transmit acoustical, electromagnetic, and other types of energy.

**Radar:**

Carbon composites can be made absorbing to radar.

**Radiolucent:**

Carbon fiber composites allow superior radiation transmission and provide for superb imaging quality.

**Production Flexibility:**

Carbon composites can be easily formed into complex shapes.

**Durability:**

Properly designed and fabricated, carbon composites exhibit very long life characteristics even in harsh operating environments.

Please contact Vermont Composites to discuss the requirements of your application.