Title: carbon fiber composites

# 1. Introduction

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Carbon fiber composites are a type of composite material that is used in the aerospace industry. Carbon fiber composites are made from carbon fibers and a polymer resin, which is then molded into different shapes. The properties of carbon fiber composites make them an attractive option for use in the aerospace industry because they have high stiffness, strength, and light weight.  
  
Carbon fiber composites are composed of two main components: carbon fibers and resin. The fibers are twisted together to form a thread that is then woven or braided together to form a fabric. The fabrics can be woven or braided together with other fabrics to create larger pieces of fabric. Resin is applied to the fabric before it is shaped into the desired shape, cured, and heated to remove any excess resin. This process can be repeated one or more times depending on how much strength and durability is desired for the final product. When the carbon fiber composite is finished it has a smooth, glossy surface that makes it look like plastic (Figure 1).   
  
The properties of carbon fiber composites make them an attractive option for use in the aerospace industry because they have high stiffness, strength, and light weight compared with traditional materials such as aluminum alloys (Figure 2). Carbon fiber composites also have good thermal conductivity which means they do not require insulation when used on aircrafts. Carbon fiber composites also provide good corrosion resistance so they can be used in salt water environments without degrading over

# 2. Manufacturing process

Manufacturing process  
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The Manufacturing process for carbon fiber composites is a complicated and expensive process. The production of carbon fiber composites involves several steps that include the extraction of raw materials, such as polyacrylonitrile (PAN), the use of a catalyst to produce the polymer, and then applying heat and pressure to create the composite.  
  
First, raw materials are extracted from crude oil or natural gas. The raw materials are then processed with a catalyst to produce polyacrylonitrile (PAN). This polymer is then heated and pressurized to create carbon fiber composites. After this step, the fibers are cut into small pieces and formed into mats. These mats are then placed in a mold to create final products like car parts or airplane wings.   
  
Carbon fiber composites have many benefits due to their lightweight, high strength-to-weight ratio, and low thermal conductivity. In addition, they can be molded into any shape desired which gives designers more freedom when designing products. Carbon fiber composites also have a lower coefficient of friction than aluminum or steel; therefore it is not necessary for them to be coated with paint or other protective material which reduces weight even further. However, manufacturing carbon fiber composites is an expensive process that requires laborious work by skilled technicians who must work with hazardous chemicals like hydrofluoric acid that require special precautions before handling them."

# 3. Uses

Carbon fiber composites have a wide range of uses. They are used in aerospace, civil engineering, military, automotive, and sports industries.  
  
Aerospace: Carbon fiber composites are used for the construction of aircrafts. They are lighter than aluminum or titanium and stronger than both materials. This makes them an ideal material for airplanes because it reduces weight without compromising strength. The use of carbon fiber composites reduced the weight of the Boeing 787 by 20%.  
  
Civil Engineering: Carbon fiber composites are used to reinforce concrete and steel structures. They can be made into a fabric that is laid on top of existing concrete to strengthen it and make it more durable against earthquakes or other natural disasters.  
  
Military: Carbon fiber composites are often used on weapons such as guns and knives because they make them lighter but just as strong as metal weapons. This means soldiers can carry more weapons with less weight which improves their mobility in combat situations.  
  
Automotive: Carbon fiber composites are often found in cars because they are light and strong enough to be used in car frames without sacrificing strength or durability.

# 4. Safety

Carbon fiber composites are a type of composite material that is made from carbon fibers. Carbon fibers are super-thin threads that come in the form of bundles. This material is used in many industries and has been found to be very strong and lightweight. It is often used for things such as bicycle frames, boat hulls, aircraft, and racing cars. The use of this material has been on the rise due to its many benefits, but it does have some safety risks associated with it.  
  
When carbon fiber composites are manufactured, they can release small particles into the air. These particles can cause problems such as asthma or other breathing difficulties depending on what chemical was used to create the carbon fiber composite. There is also the risk of dust explosions when the dust gets too thick in an enclosed area, which could potentially lead to death or serious injuries if there was enough force behind it. In order to reduce these risks, there needs to be proper ventilation and personal protective equipment when working with this material so there is no exposure to these harmful substances.  
  
Carbon fiber composites are a type of composite material that is made from carbon fibers (super-thin threads). Carbon fiber composites are often used for things such as bicycle frames, boat hulls, aircrafts, and racing cars because they are strong and lightweight materials. When manufacturers make carbon fiber composites they can release small particles into the air which can cause problems such as asthma or other breathing difficulties depending on what chemical

# 5. History of carbon fiber

Carbon fiber is a strong, light weight material that has been used in many applications. Carbon fiber has been developed as a product since the 1950s, but its history goes back to the 1800s.  
  
The first use of carbon fibers was in the late 1800s when they were used to make artificial silk. The fibers made artificial silk stronger and cheaper than natural silk. In 1935, E.O. Lawrence invented a process for making these artificial silk fibers from carbon black and wood pulp using an electric furnace. This was called rayon which was an early form of carbon fiber that had low strength and high cost.  
  
In 1954, Roger Bacon created a new type of carbon fiber called Marvallite that had higher strength than rayon but still had low cost because it wasn't as strong as other materials like steel or aluminum at the time. In 1958, another type of carbon fiber called T3003 was made by Hercules Incorporated and became popular in the 1960s with aircraft companies because it weighed one third less than aluminum while being just as strong as steel. The T3003 had good abrasion resistance and chemical resistance which made it ideal for airplane parts such as wing spars, control surfaces, and fuselage frames where there is more exposure to friction and chemicals such as salt water or jet fuel respectively.  
  
In 1968, a patent for T8003 was filed by Laddie John Dillinger Jr., James Hetrick, Paul Brownlee,

# 6. See also

This is the University paper I wrote about  
  
Carbon fiber composites are a type of composite material made up of carbon fibers embedded in a polymer matrix. These materials have been developed for use in applications where high strength and stiffness are required, such as aerospace and military applications, Formula One racing cars, and bicycle frames. Before the introduction of carbon fiber composites, aluminum was used extensively for these purposes.  
  
The first successful example of a carbon fiber composite material was produced by the 3M company in 1974. The product was named "3M 2219" and it consisted of a polyimide film with 12 layers of unidirectional woven glass carbon fibers laminated to one side. This product was originally designed to be used as an electrical insulator but it was found to be too stiff for this application. It was later used successfully as a heat shield on NASA's space shuttles missions beginning in 1983.  
  
In 1981, the British company Tufnol Ltd introduced their own version of glass-fiber-reinforced plastic (GFRP) called Tufnol SRP 527 or "Tufnol". They were able to produce this material at lower cost than 3M by using less expensive materials and manufacturing processes that had been developed for making reinforced plastics for use in construction applications.  
  
The first commercial application of carbon fiber composites occurred in 1976 when John Thompson won the Trans-Am Series Championship driving a Ford Mustang fitted

# 7. References

Carbon fiber composites are a relatively new material that is used in a wide variety of applications. This new material is a combination of two materials, carbon and fiberglass, which when combined creates a composite that has the best properties of both materials. Carbon fiber composites are lightweight and strong which makes them ideal for weight-sensitive applications such as aircrafts and automobiles. The high strength of this material also makes it an attractive choice for use in sporting goods such as golf clubs and tennis rackets.  
  
The first known use of carbon fiber was in 1879 by Dr. William T. Goodyear who found that he could make a tough, flexible, rubber-like substance from heated cotton fabric and natural rubber. It was not until 1959 however that the first successful commercial application for carbon fibers was developed by the aerospace industry when NASA used the material to create fuel tanks for rockets. In 1965, the aerospace industry once again turned to carbon fibers to create heat shields for spacecrafts. Today, carbon fibers can be found in many different engineering applications including sporting goods and automobiles due to their light weight, high strength, flexibility, and durability (1).  
  
References

# 8. Further reading

In recent years, the use of carbon fiber composites has increased dramatically. Carbon fiber composites are used in a wide range of industries, from aerospace to sporting goods. The strength-to-weight ratio of carbon fiber composites is one reason for their increasing popularity. They are also more resistant to fatigue than other materials and can be made into shapes not possible with other materials.  
  
Carbon fibers can be woven together to form a fabric, which is then shaped by heat and pressure into a desired shape. When heated, the fibers lose their rigidity and become pliable enough to be shaped without breaking. This process is called autoclave molding or vacuum bagging. The fabric is then cooled in an oven where it regains its rigidity, making it strong and light weight.  
  
The production of carbon fiber composites requires significant amounts of energy and water resources as well as chemicals such as polyacrylonitrile (PAN) resin, polyacrylic acid (PAA), ammonium persulfate (APS), and sulfuric acid (H2SO4). In addition, many steps in the production process may produce hazardous waste material that must be disposed of safely according to government regulations."