



# *Composite materials*

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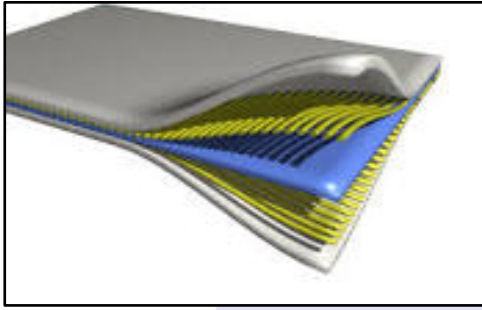
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## *What is a composite material?*

A composite material is made up of two or more constituent materials that have significantly different properties from one another.

When the two constituent materials are combined a material is formed with different characteristics from the original components



## *5 composite materials:*

Reinforced concrete and masonry.

Composite wood such as plywood.

Reinforced plastics, such as fibre-reinforced polymer or fiberglass.

Ceramic matrix composites (composite ceramic and metal matrices)

Metal matrix composites.



## *Reinforced concrete*

Reinforced concrete is a composite material. The reason it is a composite material is because it is almost always reinforced with steel.

The steel makes it stronger and more durable making it a commonly used material. It is also very versatile composite and it is used in buildings.



## *Composite wood:*

Composite woods such as plywood are made up of individual plies of wood and wood veneers. This makes it extremely durable and a strong material to use.

The plies and veneers are put together using a synthetic glue increasing the composites strength.



## *Reinforced plastics:*

Composite plastics are formed when a couple of different materials possessing unique properties bond together to produce a final product with the desired mechanical and material properties.

Some examples of reinforced plastics are fibre-reinforced polymer or fiberglass,



## *Ceramic matrix composites:*

Ceramic matrix composites are a special type of composite material.

These materials are special because both the constituent materials are ceramics.



## *Metal matrix composites:*

A metal matrix composite is composite material with at least two constituent parts. One of the parts is usually a metal, the other material may be a different metal or another material, such as a ceramic or organic compound.

When at least three materials or more are present, it is called a hybrid composite. An example of a hybrid composite is glass-carbon reinforced epoxy





## *Glass reinforced plastic:*

Glass reinforced plastic has many properties giving many advantages over metallic materials such as steel. A few examples of its properties are: high corrosion resistance, high strength, lightweight, non-conductive and high impact resistance.

As GRP does not conduct electricity it is an ideal material to be used in areas where there are high electrical currents such as railways/underground rail systems.



## *Carbon reinforced plastic:*

Carbon reinforced plastic is a fibre based material made up of carbon fibre and resin. A fibre based plastic is a mixture of two materials - one part is a material in fibre strands and this is made stronger with a resin

It is commonly used for formula 1 car bodies, crash helmets and sports equipment.

# My composite materials design:

