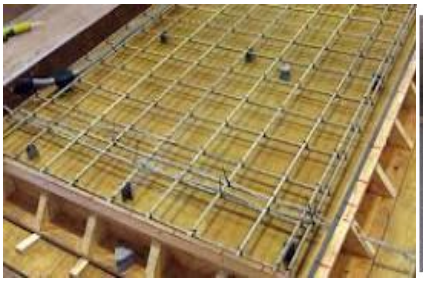
Fiberglass Rebar is a cost-competitive alternative to steel rebar. It is made from high-quality glass fibers, polyester resin, or vinyl ester with more than 75% fiber.


Raw materials: The raw materials for fiberglass rebar are glass fiber, resin, and fillers. Glass fiber is the main reinforcement material, and it provides the rebar with its strength. Resin is used to bind the glass fibers together, and it also provides the rebar with its corrosion resistance.

In terms of strength-to-weight ratio, fiberglass significantly outperforms steel. Fiberglass offers the same strength as steel but is more flexible, making it impact-resistant. Moreover, fiberglass weighs only 25 percent of what steel does while maintaining equivalent strength.

Fiberglass rebar is a stronger and lighter alternative to conventional steel rebar. It is ¼ the weight of steel, superior in tensile strength, non-magnetic, and non-conductive rebar that has a life cycle of 100+ years.

The ability to bend fiberglass rebar opens up a variety of possibilities for its use in construction and engineering projects. In construction projects, curved fiberglass rebar can be used to strengthen curved or non-linear elements such as arches, domes, and unique architectural designs.

Applications :

- RCC Roads, Pavements
- Parking garages
- Chemical plants
- Structures built in or close to sea water
- Highway Construction
- Bridge deck slabs
- Bridge Enclosures
- Reinforcement of RCC tanks.

- Swimming pool
- Radio frequency sensitive areas
- Hospital MRI areas
- Tunnel Boring Machine (TBM) ‘Soft eye’ Openings in Metro rail.

Features :

- Absolute Corrosion Resistance
- 2x Tensile strength compare to steel
- 75% lighter weight than steel
- Last longer service life without maintenance.
- Competitive and consisting pricing
- Electrical & Thermal insulator
- Excellent bond strength with Concrete
- Transparent to radio frequencies

CFRT v/s GFRP:

As the name suggests, carbon fibers are used for CFRP, whereas glass fibers are used for GFRP. Plastics based on carbon fibers have a significantly higher strength and are also lighter due to their lower density. Glass fibers, on the other hand, are cheaper, which is why they are often used.

The process of making Fiber Reinforced Polymer (FRP) rebar, also known as GFRP rebar, involves the following steps:

1. Material preparation: The process begins with preparing the raw materials, such as glass or basalt fiber rovings. The type of fiber used depends on the application's needs, such as durability, tensile strength, and environmental resistance.
2. Fiber selection: The next step is to select the right reinforcing fibers.
3. Polymer matrix preparation: The polymer matrix is usually made from a liquid resin.
4. Layup
5. Surface treatment: A surface treatment is often applied to help the concrete and reinforcing bond together.

6. Curing

The production line should be set up in a warehouse that meets certain specifications. The warehouse should be at least 50 meters long, with a ceiling height of at least 2.5 meters. The equipment location area should have a height difference of no more than 4–5 centimeters, and the ventilation should provide 200–250 liters per minute of air outflow. The indoor temperature should be at least 16–18 °C.

GFRP: Glass Fiber Reinforced Polymer-made bars' benefits:

- 2 times stronger than steel
- Up to 80% Lighter than TMT Bars
- Up to 30% Savings as Compared to TMT Bars
- As GFRP Rebars have specific application and no resale value in the open market, they are not prone to theft of TMT bars during transit or theft at site. This will further help reduce project costs by lacs of Rupees.
- GFRP elements do not require overlapping as traditional TMT bars do, resulting in cost savings on materials and labor.
- GFRP bars, mesh, and bent elements are custom-made to precise dimensions, reducing waste and minimizing rebar scraps during construction.
- Unlike steel bars, GFRP bars are rust-proof, ensuring a longer lifespan and minimizing maintenance needs.
- GFRP is highly resistant to chemical corrosion, making it ideal for use in aggressive environments or marine structures
- GFRP has 20 times the fatigue resistance of steel, making GFRP more durable under cyclic loading-420, 684 cycles for GRP compare to 23,162 cycles for steel.
- GFRP's non-conductive and corrosion-resistant properties make it well-suited for tunnel construction, where such characteristics are crucial.
- Can be used together with Steel TMT Bars for construction.

Resins

- Vinyl ester resin:

  A hybrid of epoxy and polyester resins, VE resin is stronger than polyester and more resistant than epoxy. It's often used for hobbyist projects and boat building because it's resistant to water degradation and solvents. VE resin is also known for its high bond strength, rigidity, and adhesion. However, it has a shorter shelf life than epoxy resin, so it's best to buy it on a project-by-project basis.

- Epoxy resin:
  Epoxy resin is known for its strength, mechanical properties, and dimensional stability. It's often used to make lightweight parts and durable molds. Epoxy resin also adheres well to wood and can be used with fiberglass, Kevlar, and carbon fiber cloth. However, epoxy resin is more expensive than other resins and can be sensitive to moisture and temperature changes during application. It's also more likely to yellow when exposed to UV light.


This is the cheap possible business which many people can easily enter in to. Have 3.25 Cr and you can start this project to make about 46 12 600 Meters of 12 mm bars [say about 1150 Tons] In case willing to go in for the higher production to cater to higher masses, need to invest more.

This is very simple production business and ever demanded product as also replacing steel TMT bars for the construction and so is promising.



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