

FIBER GLASS PROJECT

Mineral wool, glass wool, rock wool, fiber glass, ceramic fiber are closely related products, produced from sand/rock/ slag etc.

Fiber glass today is widely used in everything from buildings to appliances to airplanes. Fiber glass is used to control the flow of heat, absorb sound, and filter gases and liquids. Glass fibers don't burn, rot, or absorb moisture or odors. When properly maintained, they don't support the growth of mildew, mold, or bacteria.

Fiber glass comes in two forms: fiber glass wool, and textile glass fibers.

Glass wool is the most widely used form of fiber glass, notably in acoustical, thermal insulation, in heating, venting, and air conditioning filters. Textile glass fibers are made of continuous strands or filaments. They are used to reinforce materials, especially plastics, and in woven and non-woven fabrics

Proposal

There are two large and number of small units producing glass fiber / glass wool in India. Small units produce mineral/glasswool. The main areas of applicatipon are insulation (glass wool) and fiber reinforced plastics (FRP). One end use not exploited is in production of boards and panels. This is a high growth area. There is ample scope for two or three medium sized units.

Suggested capacities:

Plant with 15000 tons/ 30000 tons per year capacity may be set up with different product mix.

Manufacturing process

Fiber glass is produced by spinning or blowing molten glass into short, thin fibers. The first stage is to melt the sand/chemical mix to liquid form in large furnaces at about 1500 C,

In the refiner section of the furnace, the temperature of the glass melt is lowered to about 1,260°C (2,300°F). A stream of molten glass from the fiberglass furnace flows along a heated forehearth lined with refractory material to a point directly above the fiber-forming station where it pours through single-orifice bushings into rotary centrifugal spinners. The molten glass is then extruded from the sidewall holes as small streams of glass to form the primary glass fibers through centrifugal action and aerodynamic drag forces. The fibers are sprayed with a phenolic (usually phenol-formaldehyde) resin binder and lubricant (usually mineral oil or paraffin oil) to improve the integrity, resilience, durability, and handling quality of the finished product. A gas-fired oven dries the product and cures the binder. The resin-coated fibers are formed into a mat of fibers. The resultant fibers typically range from 0.5 to 6 μm in diameter.

If the glass fiber is needed in filament form the melt from the furnace is forced through bundles of very small orifices (typically 17-25 micrometres in diameter for E-Glass, 9 micrometres for S-Glass). These filaments are then *sized* with a chemical solution. The individual filaments are now bundled together in large numbers to provide a roving. These rovings are then either used directly in a composite application or used in an intermediary step, to manufacture fabrics

Technology

The technology is inbuilt (machinery supplier will provide the operation details and methods to produce a desired product mix).

Raw materials: sand/ rock (Basalt) / slag/ lime / dolime

Utilities: This is an energy intensive process. If cupola type furnace is used coal/ coke are used as fuel. If tank furnace is used Natural gas is used. It should be possible to use producer gas from coal as fuel. Power requirements are moderate.

Plant and Machinery

Mixing plant, Melting furnace, spinning centrifugals, curing oven, blanket rolling machine/ pipe rolling machine, filament drawing machine etc.

Project cost

Project cost would be high if filament and rovings are to be produced Rs.300 cores for 30000 TPA plant. Glass wool production plant of same capacity may cost about 50 crores.

Turnover and profitability

Revenue from glass fiber plant would be 450 crores from 30000 TPA plant

Suggested location

Raw material availability/ availability of coal or natural gas and power are main considerations

Strategy/ options

One option is to go for a large fiber glass unit that gives economy of scale. This however needs heavy investment. The other option is to source technology for a mid sized unit where glass wool products, ceramic fiber/ glass fiber can be produced with lower investment. A number of chinese companies are offering glass wool plants. There are few companies that offer fiber drawing equipment. These can be combined to give an economically viable investment option

Consultancy from APITCO : Sourcing technology. Selection of plant and machinery. Market study. Detailed project report preparation.