

## ENGINEERED WOOD

**The term “Engineered wood”**, is used to describe a range of derivative wood products which are manufactured by binding together wood strands, particles, fibers, or veneers with adhesives to form composite materials. “Wood composites” is synonymous to engineered wood. These products are “engineered” to precise design specifications which are tested to meet national or international standards.

Typically, engineered wood products are made from same hardwoods and softwoods used to manufacture lumber. Sawmill scraps and other wood waste can be used for engineered wood composed of wood particles or fibers, but whole logs are usually used for veneers, such as plywood. Alternatively, it is also possible to manufacture similar engineered cellulosic products from other lignin-containing materials such as rice straw, wheat straw, hemp stalks, or sugar cane bagasse, in which case they contain no actual wood but rather vegetable fibers.

Because engineered wood is man-made, it can be designed to meet application-specific performance requirements.

Large panels of engineered wood may be constructed from small trees  
Small pieces of wood and wood that has defects can be used in many engineered wood products, especially particle and fiber-based boards.

Engineered wood products are often stronger and less prone to humidity-induced warping than equivalent solid woods, although most particle and fiber-based boards readily soak up water unless they are treated with sealant or at least paint.

Engineered wood products are more expensive to produce than solid lumber in terms of time, money, and energy, but enjoy economic advantages when manufactured in large sizes due to the rarity of trees suitable for cutting large solid-wood panels

Although engineered wood products use the resource of wood efficiently and therefore promote natural resource conservation, the required adhesives may be toxic. A concern with some resins is the release of formaldehyde in the finished product, often seen with urea-formaldehyde bonded products.

### **Resins commonly used are,**

Urea-formaldehyde resins, (UF), most common and cheapest, not waterproof

Phenol-formaldehyde resins, (PF), a yellow-brown adhesive commonly used for exterior exposure products

Melamine-formaldehyde resin, (MF) a white, heat and water resistant resin, often used in exposed surfaces in more costly designs

Methylene diphenyl diisocyanate (MDI) or polyurethane resins which are expensive and generally waterproof do not contain formaldehyde.

**Proposal:**

There is unsatiated demand for wood products in India. Considering the limited forest resources, need for substitutes is very high. Engineered wood offers many Niche opportunities. The alternatives available are many and mature technologies for manufacture of composites are now available. This is a good area for start-ups with investment of two to three crores.

**Product mix:**

Composite panels	200,000 sq. m
Wooden flooring	100,000 sq. m
Finger jointed wood panels	100,000 sq. m
Furniture parts	5000 Tons

**Market:**

The production of plywood, particleboard and medium density fiberboards in India is valued at Rs 2500 crores. This however does not represent the real potential. The main constraint in substantial increase in production is not market. The problem is availability of raw material. Forest based raw material availability will continue to be a problem but plantation products and agro byproducts are yet to be exploited. Liberalized import procedures have opened the doors for importing wood waste and other raw materials.

The actual market potential can easily be placed around Rs. 10,000 crores per year. The factors controlling demand being price, quality and appeal of the products.

**Manufacturing process:**

The manufacturing process consists of preparing the main raw material, preparing the glue, joining the components and pressing the material in suitable press.

**Technology:**

Manufacturing technology is available from multiple sources.

**Plant and Machinery:**

The main plant consists of glue preparation equipment, joining plant like finger jointing machine and press.

**Raw materials:**

Cellulosic fiber containing agro wastes, wood waste, wood for recycle, bamboo and resins like urea formaldehyde.

**Utilities:**

Power is the main utility.

**Project cost:**

Rs. 3 to 5 crores

**Turnover and profitability:**

Turnover of Rs. 20 crores per year with 7 to 8 % net profit margin can be expected.

**Suggested location:**

Near any major city.

Entrepreneur profile: financially resourceful first generation entrepreneurs can take up this project. This is more suitable for persons who are already in construction / timber business

**Apitco's consultancy:**

There are many "Niches" in this market. Materials to be used, technology used and choosing target market all present challenges and opportunities. Apitco can help in deciding on suitable Niche by way of,

1. Market survey
2. Technology tie - up