



# Polymer Composites as Construction Materials

## Application Summary Sheet 15

**Title:** Wood Fibre Reinforced Plastics - Synthetic Lumber

**Target Audience:** Architects, Building Specifiers

**Keywords:** Decking, cladding, wood substitute, plastic lumber, recycled plastic

### Overview of application / summary:

As an alternative to natural wood decking, either tropical hardwood or chemically treated softwood, "plastic lumber" offers the advantages of low maintenance coupled with the ability to be drilled and sawn like natural timber. A number of "plastic wood" products are on the market. Tech-Wood™, for example, is a combination of pinewood fibres and additive enhanced thermoplastic. In terms of durability and dimensional stability, Tech-Wood is comparable to tropical hardwood. The material is moisture resistant, does not rot and has a high bending strength. Trex Wood-Polymer™ decking is a similar product made from reclaimed & recycled materials - waste wood fibre and reclaimed plastics. The wood fiber comes primarily from woodworking operations, while the plastic material is reclaimed mainly from stretch film and grocery sacks. In the composite material the plastic surrounds and protects the individual wood fibres. Trex is also claimed to be recyclable after use. Plastic lumber can also be used for handrails, door jambs, skirting, cladding and similar applications. Tech-wood also produce a bridge deck plank. US demand for plastic and wood-plastic composite materials in construction applications is forecast to expand more than 15 percent annually through 2006 to over \$1.5 billion (<http://www.netcomposites.com/news.asp?1280>)

### Impact of Application

#### **Financial:**

Lower maintenance costs

#### **Environmental:**

Alternative to tropical hardwood or treated softwood.

Some products incorporate recycled plastics.

Use of plantation timber alternative (either softwood or hardwoods such as teak) is considered very sustainable. In general there are very few environmental concerns over the use of treated timber, particularly in this application.

## **Engineering:**

Rot and insect proof.  
Ability to be sawn and drilled.  
Doesn't split or crack.

## **Future developments and estimated time-scale:**

Structural applications such as beams limited by the low stiffness of the composite compared with natural timber or glue laminated timber (glulam).

## **Where to get further information**

### **On Products:**

Techwood  
<http://techwood/>

Trex  
<http://www.trex.com/>

TimberTech  
<http://www.timbertech.com/>

Trimax Structural Lumber  
[www.carefree-xteriors.com](http://www.carefree-xteriors.com)

Knotwood  
[www.knotwood.co.uk](http://www.knotwood.co.uk)

### **References:**

#### **Building a curved deck with synthetic decking**

Putnam T (1997)  
Fine Homebuilding Aug/Sept 1997