

TimberTech WPC planks in situ and close up (below).



Wood Plastic Composite – an exact science

Lumber has been a building product mainstay for centuries due to its abundance and the lack of viable alternatives. In recent years, there have been numerous efforts to protect natural resources to ensure their long-term viability and to reduce the negative effect of over-harvesting on fragile ecosystems.

In response, forward-thinking companies have heavily invested in research and development to create alternative building products that closely mimic the strengths of wood, while eliminating many of its shortfalls. One such product is Wood Plastic Composite (WPC), manufactured by companies like US-based TimberTech.

According to a 2007 Fredonia Group study, 'Demand for wood-plastic composite and plastic lumber is projected to advance about 10% per year through 2011 to US\$5.4 billion. Decking will be the largest end use for these alternative building materials, accounting for 44% of demand.'

WPC has a major advantage over wood as it can be manufactured to meet almost any desired application, even the most demanding conditions associated with docks and marinas. WPC products behave much like wood and can be cut or routed using conventional woodworking tools. But, unlike wood, they are moisture-resistant, resistant to rot and insects, and engineered to prevent cracking, splitting or splintering.

In short, they don't require the usual annual maintenance of sanding, sealing, staining or painting. Because of this, most manufacturers offer warranties that cover at least ten years and some offer 25-year warranties.

There are a number of ingredients integral to the overall composition of WPC boards that can affect the overall aesthetics, weather-resistance and structural integrity. It is an exact science that only the best manufacturers have been able to consistently achieve. These manufacturers have been able to strike a balance between the amount of wood and plastics to overcome issues such as water absorption, dimensional changes, heat build-up and deflection between joists.

The wood content gives the plank its

functional characteristics. However, if planks contain too much wood content, they are subject to accelerated deterioration, mould growth and warping or twisting when exposed to water. If planks have too much polymer (or plastic) content, there can be heat retention issues. Over many days of sun exposure, boards with too much polymer content can begin to sag, bend or warp. WPC does not suffer from these shortfalls because the wood balances with the plastic content and provides the benefits of heat release and plank strength.

Additionally, many docks are made with hollow deck planks, which - according to TimberTech - can break down more quickly under high traffic and heavy use than WPC planks. Hollow planks have the benefit of being lighter than solid core planks, but solid core planks offer the greatest strength and rigidity. A solid WPC deck board will allow for greater load-bearing capacity and will last longer, even spanning 24inch on-centre.

In wood-plastic composite products, the use of the right amount of plastics increases resistance to the elements and ensures durability of the plank by acting as a sealant. This also enables manufacturers to decrease scratching on the board surfaces.

Many manufacturers also offer complete composite systems—from deck boards to railing systems to fencing.

Although the initial material costs are more than treated lumber, these costs are easily recouped over the lifespan of the product by eliminating many of the annual maintenance costs and increasing the amount of time before replacement.

Two examples of wood plastic composite products are TimberTech deck planks and one product specifically offered for docks, DockSider. TimberTech, one of the first companies in the world to produce a WPC decking product, manufactures its composite wood products from post-industrial wood from the cabinet and hardwood floor industries. This is then ground into wood flour. Each year, the company uses more than 100 million pounds of scrap that would otherwise end up in landfill.

The wood flour is combined with plastics to extrude decking, railing and fencing products. The end result is a more standardised, durable product with fewer defects and a longer life cycle.

TimberTech decking planks are made with high quality raw materials blended with UV-inhibiting pigments to produce products with consistent colour. Because of the quality of material used, most TimberTech products are claimed to fade less than other composites. Additionally, TimberTech colours were developed with highly reflective, inorganic pigments that minimise heat build-up.

TimberTech's DockSider plank is a 1¼ inch × 5½ inch solid plank, engineered for maximum strength to weight efficiency, that allows the boards to span 24 inch on-centre, which is one of the most common configurations. Most planks, according to the company, are only 1 inch thick, which does not provide enough structural integrity to span 24 inches. DockSider planks, along with all other TimberTech planks, are ADA compliant for slip-resistance.

WPC boards offer a low-maintenance alternative to traditional wood that will pay dividends in the long run due to reduced maintenance costs and longer cycles between plank replacements.

Composites possess many other characteristics not found in traditional wood materials. For example, the plastic additive helps the product resist rot and insects, making it particularly suitable for docks and marinas. In addition, the material absorbs less moisture than wood and often exhibits greater dimensional stability. Once formed, it will not crack, warp, split or twist.

When considering wood plastic composite products, TimberTech advises that it is best to look to companies that have a long history of producing quality products while staying ahead of the curve by introducing innovative products that meet user demand.

The above article was prepared in association with TimberTech (www.timbertech.com), one of the world's largest manufacturers of alternative decking products.

