See the Plastic through the Trees

by Angela Rodenburgh

This article is the second in a series comparing the environmental benefits of plastics to competing materials, brought to you by the IAPD Environmental Committee. See the February/March 2015 issue of this magazine for an examination of plastics as compared to steel.

In most circumstances, many people outside of our industry would find it difficult to consider plastics an environmentally friendly material. With headlines pertaining to micro-plastic pollution, the banning of plastic bags as well as the infamous garbage patch, it's no wonder it's hard to see the green side of plastics. However, industrial plastics are made, used and recycled very differently from single use plastics and their impact on the environment is entirely different as well.

What is the sustainability of industrial plastics and how can these versatile materials be the most environmental friendly choice? Industrial plastics have a number of properties that help address sustainability, one of the most notable being weight. Transporting lighter materials improves fuel consumption and decreases resulting CO_2 emissions. Combine this with the durability and lifespan of plastics and the ease with which plastic can be recycled, and one can often arrive at a net environmental impact that is lower than comparable materials such as wood.

In addition, industrial plastics' low coefficient of friction and lighter weight reduce the load on conveyor drives, resulting in lower electrical consumption. This in turn reduces the amount of wood fuel required to power steam plants and the corresponding reduction in CO_2 emissions.

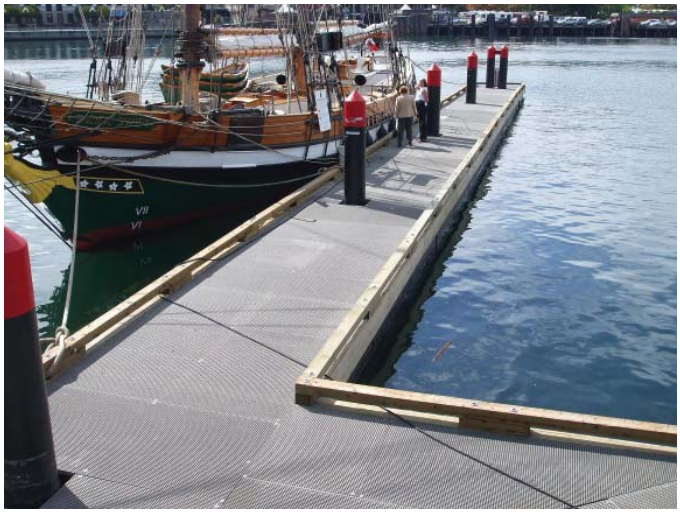
Many plastic materials used in playgrounds, architectural projects and marine applications can significantly outlast wood in terms of life expectancy. They never need painting or routine maintenance to preserve aesthetics and structural integrity, both of which can be damaging to the environment. With a longer lifespan, materials don't need to be replaced as frequently, leading to lower demand for scarce wood resources and the elimination of added consumption for the transport and manufacturing of numerous replacements.

Plastics are not subject to corrosion, insect attack or water deterioration. They don't splinter, crack, rot, delaminate, swell or absorb water and can be UV stabilized to withstand harsh marine environments. This is why many recreational boat hulls, boat accessories, decks, ramps, dock fenders and even bridges are now made of plastics or plastic composites. Plastics also never need to be treated or painted, which saves a tremendous amount of labor and protects our oceans and lakes from the risk of contamination from paints or stains or chromated copper arsenate (CCA) treated wood.

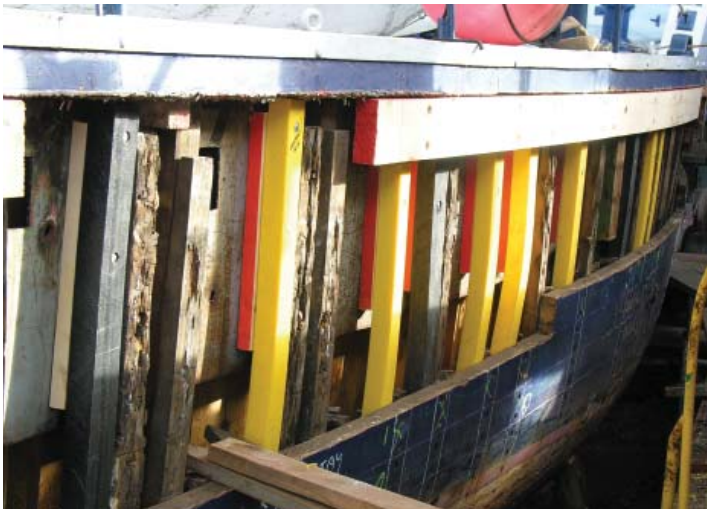
Plastic decking is another example of an application where the net environmental impact might surprise the average user. This is due to two reasons:

1) First, plastic decking is commonly made of recycled plastics, such as polyvinyl chloride (PVC), polystyrene (PS), polylactic acid (PLA), high density polyethylene (HDPE), polypropylene (PP) and acrylonitrile-butadiene-styrene (ABS). These materials are being put to good use, rather than ending up in a landfill ("5 Benefits of Wood-Plastic Composite." Sino Concept). In fact, much of the plastic decking materials in use today come from 1.5 billion plastic shopping bags that are returned for recycling in the United States.

2) Like the plastic materials for marine applications, plastic decking doesn't require finishing and won't ever crack, warp or splinter. Plastic decks last longer and require next to no maintenance without having to be stained, painted or sealed, thus leading to a lower overall impact on the environment. Plastic comes with similar properties to all natural wood, meaning you can



Redco™ Mini-Mesh FRP dock, ramp and decking panels.



Redco™ UHMW boat ribs won't rot, compared to their wood counterparts.

Redco™ Tuffkast dock fenders at a ferry terminal.

shape, drill, and cut and fasten them using the same tools and techniques.

Within a shipping warehouse, plastic pallets and shipping crates can also be an environmentally sound choice over wood given their superior lifecycle. Wood pallets can be undesirable as well because they give off moisture, splinter, harbor bugs and contain fasteners that can damage products. Plastic pallets are durable, clean, bug-free and weather-resistant and contain no fasteners. Plastic pallets can also be returned and reused, then recycled if they become damaged (inboundlogistics.com. "Selecting Pallets: Wood vs. Plastic." Deborah Catalano Ruriani, November 2008). They are especially suitable for exporting to certain countries that require the fumigation of the container if wood pallets are used.

Measuring the environmental impact of a material extends beyond traditional measures such as amount of greenhouse gas emissions or the sustainability of the manufacturing/harvesting process. Indoor air quality is becoming an increasingly important factor being tracked by businesses today and certainly impacts the working environment of staff. Poor indoor air quality can cause problems ranging from allergies to headaches and can thus have an impact on worker productivity ("Breath of Fresh Air: Improving Indoor Air Quality at Your Workplace." Green Plus). Common materials such as particleboard, pressed wood and plywood can greatly affect indoor air quality (IAQ). The resins and glues in these materials are often filled with formaldehyde. Medium density fiberboard (MDF), commonly used in furniture, has the highest levels of formaldehyde. All-wood products do not have these compounds, but the environmental advantage gained from this absence is lost from the additional strain all-wood products place on virgin forests. In comparison, plastic furniture, architectural elements and finishings don't present these air quality problems.

By doing more with less, the use of plastic products help promote energy efficiency, reduce greenhouse gas emissions and conserve resources. Together we can enhance plastics' environmental benefits by remembering to use industrial plastic products with the longest lifecycle and recycle them after use, for they are the most valuable of materials.

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