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FEATURE

Making an impact in the UK market

Dom Harrison

Composite Prime

Newcomers Composite Prime describe their journey into the composites market.

Dom Harrison and Charles Taylor are two businessmen working in the UK plastics and lumber sectors and have recently established a company, Composite Prime, to sell and market a range of composite lumber and plastic products that, while already extensively in use in other parts of the world, are relatively new to the UK market (Fig. 1).

The venture combines both men's family histories in the lumber and plastics sectors. Dom's father, Geoff, along with Kevin Mcdonald, in 1980 co-founded and many years ago floated Polypipe plc, based in Doncaster, South Yorkshire. It is now the world's largest manufacturer of plastic piping systems for use in the residential, commercial, civil and infrastructure sectors.

Dom's colleague, Charles, owns and runs Taylor's Lumber Center in Bradford. He is a third generation lumber merchant whose family has been closely involved in the lumber industry since 1950.

While first establishing Composite Prime in 2015, the journey has followed a carefully controlled programme of research and development and they are now beginning to make their mark in the UK as recognised producers and distributors of wood plastic composite products to both the residential and commercial markets.

Composite Prime specialise in wood plastic polymer composite products that combine two or more materials with significantly different properties to produce a new material with characteristics different to the original constituent parts.

It's a combination that creates the natural look and feel of lumber with the strength and durability of the high density polyethylene plastic – a composite that combats many of the problems associated with traditional lumber products.

Finding a market

Composite Prime is targeting the UK decking, fencing and cladding sectors and is now rolling out a high density (HD) product range that utilises the latest composite technology to produce a long life, low maintenance material (Fig. 2).

HD Deck is a long-lasting alternative to lumber; combining traditional wood appearance with the durability of plastic and some industry experts are already predicting it could take over from lumber decking in the UK.

It is made of 60% wood flour, 35% recycled high density polyethylene (HDPE), plus additives, including UV light absorbers, antioxidants, bonding and coupling agents, lubricants and colourings.

The combination of these ingredients produces a finished product that outperforms traditional treated lumber. Unlike traditional lumber, HD Deck requires no rot prevention treatments due to the naturally fungal resistant nature of wood plastic composite. It maintains its good looks years after installation and is also comfortable and safe to walk on, even barefoot, as it's splinter-free.

HD Deck is also a sustainable product, reinforcing the ongoing commitment to the environment. It comprises 100% Forest Stewardship Council (FSC) certified wood from sustainable sources that can be traced back to origin, along with recycled plastic.

HD Fence is a range of wood plastic composite fencing that provides an alternative to traditional wooden fencing, though the wood component gives the product a natural look and feel to the boundaries of outdoor living and recreational spaces. It is available in different colours, some developed to replicate traditional real wood.

Not all composites are the same

While wood plastic composites are ground-breaking new products that offer a low maintenance alternative to timber, not all composites are the same.

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FIGURE 1
Composite Prime's Dom Harrison, left, and Charles Taylor.

FIGURE 2
An example of a Composite Prime installation – decking for an English summerhouse.

Many wood plastic composites on the market use recycled high density polyethylene (HDPE) to offer sustainability. However, stringent sourcing and quality control to ensure high quality HDPE is crucial to produce a quality composite.

Impurities can cause quality issues with the product that may not be visible or noticeable initially at the time of purchase, but will after a couple of years show themselves. This is why Composite Prime source raw HDPE materials, recycle them, and run many different batch tests at every stage of the process to ensure the purity of the HDPE.

FIGURE 3
Composite Prime wood flour.

Wood plastic composites are made in much the same way as standard plastic extrusions, the main difference being that with wood plastic composites the moulds have a shorter life expectancy, so moulds have to be replaced on a regular basis to keep the profiles nice, clean and sharp.

The pursuit of such quality is crucial, though bear in mind that some manufacturers may put more effort into cost-saving at the expense of quality. Here are some of the tricks they might use:

Many people regard weight to be a good thing. If something feels heavy it must represent quality. In fact, in terms of wood plastic composites, lighter is better. Heavier wood plastic composites will contain a higher amount of filler, such as calcium carbonate.

Calcium carbonate specific gravity is over twice that of both the wood and the HDPE, which have a specific gravity marginally less than water. A small amount will make a big difference to the overall weight.

Why use calcium carbonate?

Firstly, it increases the weight and, just like plastic in its raw form, wood plastic composite is traded by weight. Making it heavier allows you to sell less for more.

Secondly, calcium carbonate is used to give a higher tensile strength in test reports. The negative aspect of this is that while the composite gains tensile strength, it loses its flexibility and becomes more brittle. Problems occur when rain water saturated with CO2 meets the calcium carbonate. A reaction takes place where calcium bicarbonate is formed.

Calcium bicarbonate is water soluble and, therefore, allows water to penetrate the material, which will cause material degradation. Laboratory tests normally use pure water (not saturated with CO_2), which will result in inaccurate test result data.

Increased wood to plastic ratio

This is a very common 'cheat.' The wood in the composite is one of the cheapest ingredients, while the plastic is one of the most expensive and makes up the majority of the cost. Increasing the wood content will give a composite that has a slightly 'powdery' feel. It will be less strong and will chip more easily than others with

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