

# *Composite Decking*

## *The in's and outs*

### **PART ONE**



*Composite Decking is fast becoming the norm for the building industry as availability has become more wide spread. Just as new technologies are constantly changing the method of construction, composite decking has changed decking arena forever as the home owner seeks out a low maintenance option for their dream entertainment area.*

**But before we can jump ahead to all the fluffy marketing guff, (low maintenance, great looking etc...) we need to work through the product as a whole.**

#### **History**

Commercial production of composite decking is believed to have commenced in the United States around 12-15 years ago. As home owners, builders and general users of timbers were looking for a decking alternative that did not rot, crack, move, twist whilst avoiding the regularly maintenance regime applied to timber decks. They started with plastics, introduced wood fibre, and Wood Plastics Composite (WPC) decking was born. From this point each manufacturer has added their own secret ingredients to add additional benefits to the product. WPC Decking is manufactured via an extrusion process, simply all the ingredients (including colours) are placed in a large hopper mixed up, cooked and pressed out to the desired profile.

From the mid 1980's WPC decking sales have grown to now occupy to around 19% of the US decking market and set to grow in excess of 42% by 2010. Therefore it is coming to Australia, if it is not here already, so get prepared.

#### **Wood Plastic Composite (WPC) Decking**

Many questions bouncing around the market are often left unanswered as the universal marketing of WPC Decking takes hold with brochures being very general. They offer home owners great looking products that avoid many wood's specific problems. Rot, insects, warping, splinters, combustibility, maintenance and environmental concern treated timber, but can they deliver?

Everything new should and usually does look great, but it is important to understand that not all WPC decking is created equal. The base materials that go into making a



deck board are critical as this determines how the board will perform in various locations and climates. Just the sun exposure and temperature range in a given day, let alone a season, will put a beautiful deck under constant stress even when it is not being used. All composites are prone to expansion and contraction as climatic conditions change. Expansion rates may be as high as 1mm every 4° increase in temperature. In these extreme cases screw sheer or end tear is common. The rate of expansion varies from product to product and this is why some introduced a secret fixing system to get around screw shear issue. While the expansion co-efficient other products may be very low.

## **Ingredients**

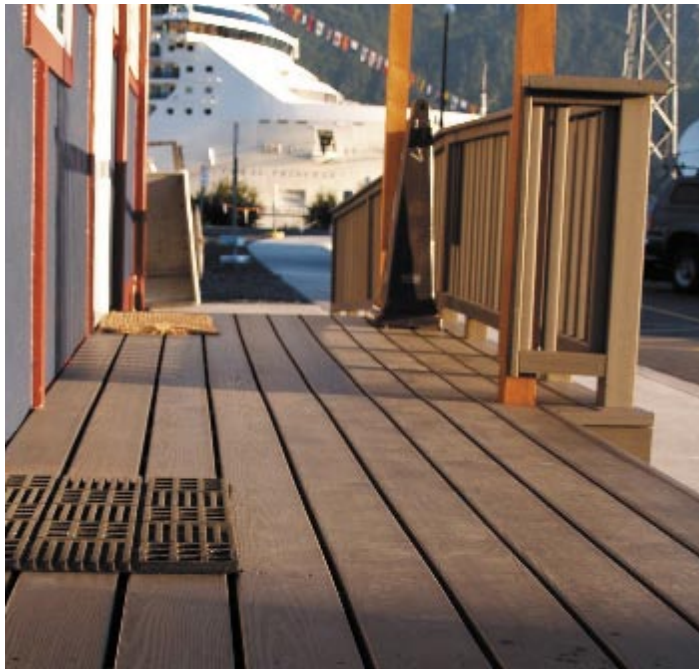
What separates WPC decking products from each other over time is the type of plastic and wood fibre that is used. There are two types of plastic groups in use. They are as distinctly different from each other as Softwood is from hardwood. One plastic is PVC, which is derived from saltwater and natural gas. The other is HDPE (high density polyethylene) which is petroleum or oil based. Both are plastics but with very different characteristics.

Currently PVC is the exterior plastic material of choice. Windows, doors, gutters, and fencing, are a few of the commonly accepted PVC products. PVC products are UV stable, weather well and are dimensionally stable. PVC has a hard surface and is fire resistant.

HDPE, as used in most WPC Decking boards, has higher strengths and is usually used in higher-grade "tough" grade bags that do not tear easily. HDPE products lend themselves to be flexible and naturally have a softer surface than PVC products.

In simple terms a HDPE (polyethylene) product has a softer feel underfoot and can be worked easily with standard wood working tools. Therefore most of the products in the Australian Market use it as end users want a natural timber feeling product. The HDPE may be sourced from recycled materials (milk bottles) or pure polymer. Both have there positives and negatives, recycled gives you the environmental friendly feeling but it is not chemically designed for sustained exterior use, and the lower the grade of recycled material the quicker deterioration may set in. The pure polymer gives more consistent colouring and longer life span but is derived from virgin material.

The wood fibre plays an important part of a composite product as it is a filler to reduce the production costs, like sand is to cement. Given the costs of the ingredients are vital in a manufacturing process as reducing the cost of them may aid sales of the product. The ratio of filler to plastics in composites should not get above 55% otherwise the long term integrity of the product may be questioned. Depending on the product the wood fibre may be pine, maple, oak, teak or tropical hardwood. (Beware that Asian producers are



using fibre glass along with wood). Each wood fibre used in composite products has its own characteristics is term rate or tannin bleed (this will leave brown marks on the surface after the first wetting), and durability. The wood fibre is commonly reclaimed from furniture manufacturing (or similar) factories for the use in these products.

### **Installation**

Surface hardness and the wood used in composite boards have an interrelated roll in the potential breakdown of the product. PVC used in a WPC decking is a "hard" plastic when compared to HDPE. When installing an HDPE, one can easily use a nail gun or screws but the soft surface tends to "mushroom" up around the fastener. Pre drilling is recommended by most manufactures to reduce the risk of mushrooming. A PVC board will stay flat and not dimple or mushroom. They usually come with recommendations to pre-drill the ends of their boards and to use screws rather than a nail gun.

Before the first tools are lifted (including building the substructure) ensure that the products installation guide is fully understood otherwise the warranty may be void. They all vary slightly (i.e. joist spacing may vary anywhere between 350mm to 500mm) and are constantly changing so before commencing a new project review the installation guide. Most warranties require a warranty card to be filled in and returned to the supplier within 30 days of installation.

Manufactures introduced hollow boards to reduce the product cost, as they require fewer raw materials compared to the same size solid profile. But hollow profiles have an increased surface area which if installed near water may lead to increased risk of failure as the surrounding atmospheric moisture may be absorbed in to the wood

fibre making it swell and shrink putting pressure on the plastic resin (refer to manufactures guidelines). Solid boards have a reduced chance of absorption but can occur with some products. The hollow board requires more accurate installation due to specific fixing points; otherwise the fastener may weaken if installed incorrectly.

### **Appearance**

Embossing or brushing the deck surface is the norm for this range of products. This removes lubricates used in the manufacturing process whist adding to slip resistance and appearance. One down side to brushing is the chance of stain absorption as the exposed wood fibre has the chance to suck up any red wine (or similar) to leave a permanent mark. Deck cleaner may be used otherwise it may require a light sand to remove the mark completely. To reduce chance of permanent marking look for smooth or embossed products that has not been brushed.

WPC decking products come in a great range of natural colours including every brown possible, light brown, honey brown, red brown, dark brown and greys. Literature will state WPC decking is colour fast and is fade resistant, but it never will state it will not fade. Therefore advise the home owner the decking will fade over the first 10-12 weeks before it settles down, the rate of fade and the extent of fading is dependent on the quality of the product.

Generally appearance decisions come down to personal preference.

### **Conclusion**

It may be tough sometimes to distinguish the good from the bad so do your research when selecting a product. Remember, if you are looking at buying WPC decking, think long-term. Get the brand that is going to address the conditions of weather, use, construction method proposed and wear for the home and lifestyle.

### **Key points to investigation?**

- o Length of warranty - tells a lot about the product.
- o What the warranty covers - read the warranty card.
- o History of the manufacturer - experience is priceless
- o Installation guide - read it and follow it.
- o Ingredients - pure vs recycled, softwood vs hardwood vs not wood at all.
- o Wood Fibre - generally darker the colour the greater the risk of tannin bleed.
- o Expansion Co-Efficient - understand how much it will move
- o Price - you get what you pay for
- o Water absorption rate - Lower the better
- o Slip resistance - Compare products **EG**