

# Growing Pains



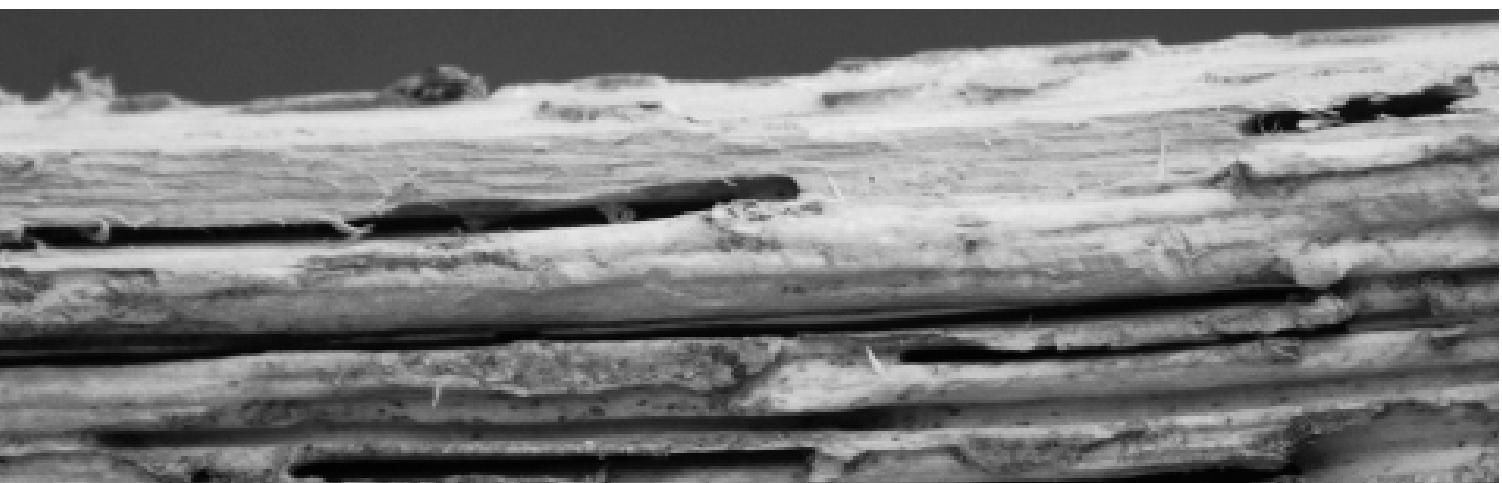
The Truth About Timber and Its Alternatives  
[www.innowood.com](http://www.innowood.com)

## Introduction

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The phrase “they don’t build houses like they used to” is inherently true, and there is good reason for this. Older homes, with traditional structures and features might hold up, but holistically they don’t offer all of the efficiencies and resistance to adversities that new buildings do. This design evolution, in response to the increase in demand for high performance buildings, tough economic conditions and stringent building codes, has seen an influx of new building materials being offered in place of traditional materials such as timber.

Whilst choice is never a bad thing, it does make selection a little harder. So when designing a commercial building, house, or renovation, and comparing suitable materials, there are several key factors that must be considered. Cost, durability and aesthetic appearance are of course always front of mind, but consideration should also be given to its environmental impact, compliance to building codes and safety standards, and its ability to withstand Australia’s harsh and often catastrophic weather conditions. Finding a material with all of these attributes and more, can be a challenge.



## Challenges of Traditional Timber

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Timber used in commercial and residential homes has many known advantages. As a building material it is very versatile, strong and aesthetically pleasing, achieving a beautiful traditional finish, which has been popular for hundreds of years. But it is well known that when not treated and maintained frequently, timber can rot, causing unsightly deterioration that affects a building both visually and structurally.

Firstly, because wood is a hygroscopic material, it will adsorb surrounding condensable vapours and loses moisture to air below the fibre saturation point<sup>1</sup>. In other words, when the air is humid, wood adsorbs moisture and swells; when the air is dry, wood loses moisture and shrinks. Various finishes and treatments may be used to slow this process, but in general they do not stop it<sup>2</sup>. When planning to use timber, you must always consider its vulnerability to expansion and contraction and plan for this in the design. Hindering this natural process through mechanical intervention results in serious splitting problems<sup>3</sup> and can affect structural integrity.

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## Rot, Mould and Termites

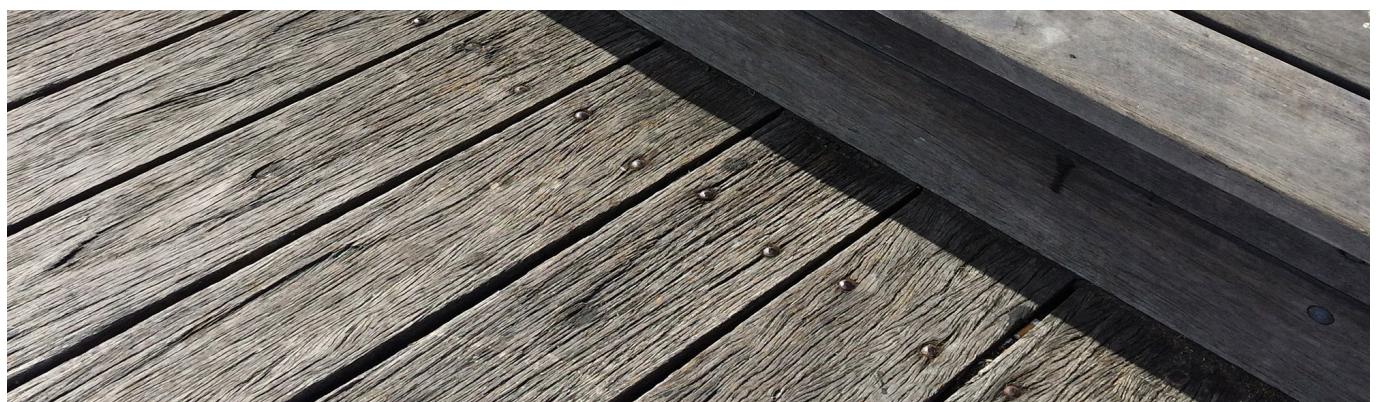
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Other agents causing the deterioration and destruction of wood fall into two categories: Biotic (biological), which includes decay, mould fungi, bacteria and insects, and abiotic (non-biological) agents, such as sun, wind, water, certain chemicals and fire. Of the first, termites and beetles- otherwise known as borers, eat through wood, creating holes that in the worst case, can affect the structural integrity of the entire building. In South Australia particularly, recent industry surveys suggest about one third of all unprotected properties are subject to attack by subterranean termites, with most homes in built-up urban areas at risk of termite infestation, especially if well-established gum trees are nearby<sup>4</sup>. The general assumption, particularly as homes become more modern, is that termites are extremely rare, but reports published by the CSIRO suggest otherwise. It has said that termites cause more damage to homes in Australia than fire, floods, storms and tempest combined, with the estimated cost in 2004 surpassing \$780 million per year, and new estimates placing it above \$1 billion per year<sup>5</sup>. In fact, it is estimated that on average, one in every

three properties will have active termites<sup>6</sup>.

Even without the insects, timber is vulnerable to environmental factors such as temperature, humidity and moisture, which promote the growth of fungi on wooden building materials. Eventually, if the timber remains wet, fungi growth can cause the wood to lose its strength and in some situations may become dangerously unsafe<sup>7</sup>, particularly in flooring applications. A high level of maintenance is therefore recommended in order to treat and inspect timber for tell-tale signs of decay so as to avoid irreversible problems further down the line.

Australia's climate, punished by global warming, is growing increasingly challenging and is the cause of many problems relating to timber. Firstly, the reaction of timber in a fire is a major factor to consider when choosing a building material. Different species of timber offer different ratings so it is important to understand the properties of each.



## Sea and UV

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Additionally, with more than 85 percent of Australians living within 50km of the coast<sup>8</sup>, salt damage has become an issue for many home owners. Sea salt, coupled with high temperatures and moisture can cause defibration of timber, whereby the natural glue that holds wood fibres together, breaks down to give the timber a furry or woolly appearance<sup>9</sup>. High levels of ultra violet exposure are instrumental in the breaking down of external finishes applied to timbers, causing movement and weathering of surfaces. Retaining the look and colour of painted timbers, requires a high level of maintenance to combat this naturally occurring problem.

As always, cost remains an important point for any stakeholder in the building industry. Forgetting the need for frequent maintenance, high quality timber is still considered an expensive material, with the sourcing of timber species sometimes difficult. If you have pre-existing timber structures, and wish to add to them, getting an exact match is near enough impossible. As it is a natural product, there will nearly always be grain and colour variations between batches/planks.

## “But Timber is Easier on the Environment, right?”

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There is a lot of controversy about whether composite timber or natural timber is the more environmentally friendly choice, with timber often triumphed as the winner due to the general thought process that it is all-natural, coming from the forest to your backyard without any manufacturing (aside from cutting and shaping, of course). However the harvesting of timber used in building a home can cause adverse impacts on biodiversity, including extinction of species, destruction of natural systems and habitat, degradation of ecosystems and fragmentation of habitat and populations<sup>10</sup>. Globally, large (and old) timber trees are becoming ever more scarce to the point of being endangered - particularly some of the favoured rainforest species. Many timber traders, especially in Australia obtain wood from plantations so as to reduce the negative impact on the environment. One consequence of this is that of the thousands of tree species we now use globally, we may eventually get most of our wood from only four or five species<sup>11</sup>.



## “How is Composite Timber Any Different?”

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Firstly, composite timber is usually sold in a variety of wood-toned or painted finishes, giving it the look of timber that people love. It is made from a combination of timber fibres and plastic, which offer the look and workability of wood, but in the form of a much denser, stronger and weather-resistant material. It is ideal for many applications, such as decking, flooring, internal and external cladding, furniture and more, due to its ability to hold up well against water, sun, insects and salt air- all typical enemies of timber. Of course as a result of being resistance to these factors, composite materials do not require the same level of maintenance that natural timbers do.

Many manufacturers of composite decking materials claim that it is an environmentally friendly alternative to traditional timber decking because instead of harvesting rainforest or plantation trees, sawdust and other timber by-products are used. In some cases, all or some of the plastic used in manufacturing composite decking comes from recycled plastic as well<sup>12</sup>.

When compared to natural timber, composite timbers have a conversion-rate from tree to useful material of about 80 to 90 percent, compared with only 40 percent for solid timber<sup>13</sup>. It is important to note that in the past, there has been some concern about the manufacture of composite timbers, that they are often made using either epoxy or formaldehyde glue<sup>14</sup>, both of which emit chemical vapours and gases. So when choosing a composite timber supplier it is important to find a supplier of non-toxic composite timber or be prepared to seal boards with quality paint.

Additionally, when used externally, around pool areas and walkways, composite timber is unlikely to split or delaminate, making it a much safer material to use in wet areas to limit slipping or splintering. Timber, being naturally prone to absorb moisture makes it a less than ideal material for areas likely to be exposed to water, with composite timber maintaining a longer life span due to its water and mould resistant properties.

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# Innowood Product Provide Total Architectural Solution

INNOWOOD composite timber is a sustainable alternative to natural timber, offering versatility and performance in residential and commercial applications, including decking, wall and ceiling cladding, railing, screens, shades and battens. With a look and feel that is very similar to natural timber, INNOWOOD is available in a wide range of natural wood grain timber colours and suitable for matching with existing building and features. Its flexibility of design and ease of installation has seen INNOWOOD showcased in many large scale commercial projects throughout Australia, and is recommended for its ability to withstand adverse environmental conditions.



In 2006, INNOWOOD was used in the construction of the Sydney Wildlife World project, chosen in a profile reminiscent of traditional maritime timber wharves. INNOWOOD products installed on this project have stayed true to the rustic appearance, preserving the natural hardwood timber look.

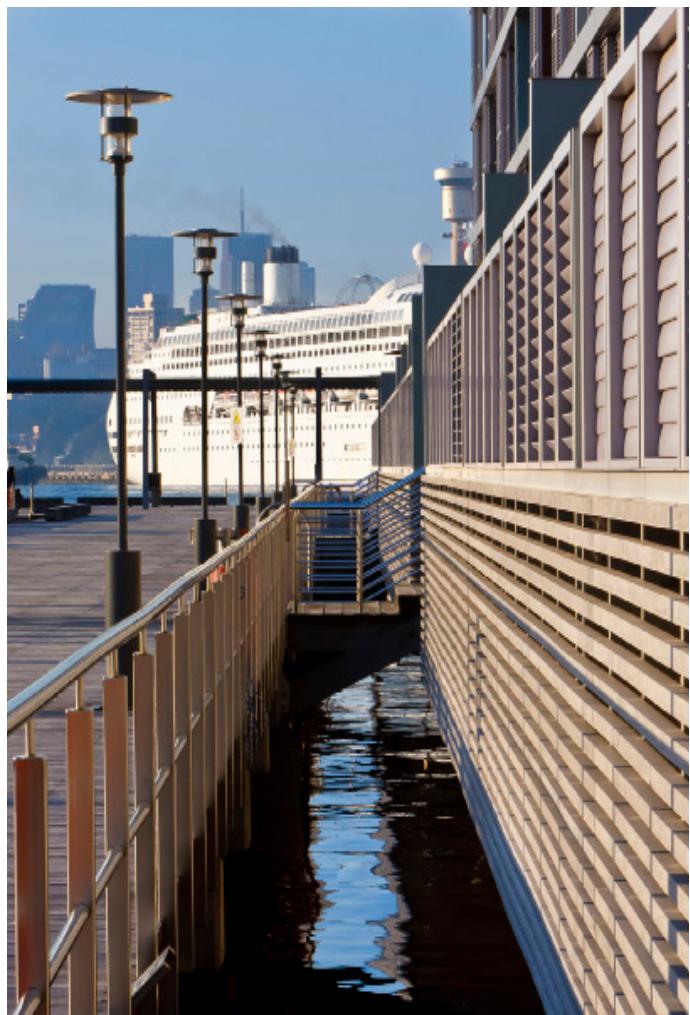
INNOWOOD replaced the original specification of hardwood recycled natural timber and achieved up to 70% facade weight reduction. Significantly resulting in a 40% cost saving on the construction of this project, accounting to cost saving of around \$1 million on the overall project.



In 2007, INNOWOOD was awarded Wharf 8&9 Sydney project due to its ability to withstand the deteriorating effects of saltwater. Innowood product was durable and solid and has not been maintained and repaired since the installation in 2007 .



This project demonstrated to the industry that INNOWOOD is capable of delivering the ideal solution and timber alternative, even in the most challenging environment.



## Material Specialties

INNOWOOD has been tested through third party testing authorities to have the qualities of being a fire retardant with the quality of absorbing very little moisture. As a 100% recyclable and non-toxic product, INNOWOOD is a sustainable and environmentally responsible product, fit for the challenging built environment of today.



Low  
Emission



Water  
Resistance



Fire  
Retardant



Thermal  
Resistance



UV  
Resistance



Termite  
Resistance



100%  
Recyclable



Acoustic  
Performance



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INNOWOOD is committed to finding new ways to do more with less