

# WSA Material Matters



## Why Wood?

Our relationship with wood is far more complex than you might first think, it is one of our most loved materials but also one that is linked to our existential existence.

Everyone knows where wood comes from, but the breadth of its meaning and use to us is constantly evolving. So why is our connection to wood so deeply ingrained into our lives?

## *A Material More Than Ancient*



Orangutang using a spear made from wood in Borneo

The use of wood as a material for making does not solely belong to humans, a variety of other animals have been seen using this material to make tools and structures with. From early Palaeolithic times wood has been the material for choice for construction and it goes without doubt that our pre-modern human ancestors would have been keen wood users too.

As a material beyond its ability to be fashioned, wood as a material for producing fire has been key for the development of us as humans. The ability to control fire was a key early human development that was entirely dependant on our use of wood - this allowed the forming of our societies and many other technologies including the invention of ceramics and metalworking.



## Hard and Soft

Woods are most commonly divided into two categories - hardwoods and softwoods. The hardness of wood however depends on what type of tree it comes from, usually if a tree loses its leaves in winter (deciduous) it will be a hardwood and if it is evergreen it is most likely a softwood. The speed at which a tree grows, is also usually an indicator, slow growing resulting in hardwood and fast producing softwood.

Hardwoods are more commonly used where durability is required, in construction for example, or producing quality furniture or flooring. Whereas softwoods, which are also used for construction, are more commonly used where longevity is not as important but flexibility and speed of working is.

In the United Kingdom the native hardwoods you will come across are most usually are Oak, Beech, Ash, Birch, Sycamore and Walnut. The main softwood you will come across is Pine.

The variety of different woods is huge, and their individual colours, grain appearance, hardness and workability varies wildly. The diagram on the right shows a selection of different woods from around the world - their different colours and relative hardness.

With time and familiarity you can learn to spot different types of wood based on their appearance, uses and characteristics.



## *Things are not always what they appear to be*

Want to make an object out of beautiful expensive hardwood but don't have the cash? Since Ancient Egyptian times the practice of taking a thinner slice of a high quality wood and gluing it to the surface of a cheaper one has been used - this is called a veneer.

A veneer you will find on wood today is around a few millimetres thick, it is real wood and carries the beautiful appearance but is most often mounted on a cheap board material, meaning it won't last as long as the real thing and most likely won't have the same strength. One of the ways to spot veneers is to follow the grain on a piece of wood over a corner and see if it lines up (or if it is suddenly a different material altogether), if the grain is suddenly running another direction or disappears, then it is a veneer. If done well they can be hard to spot though!



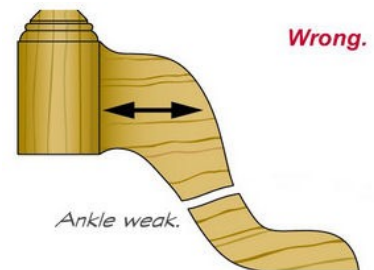
Example of a oak veneer on MDF board

The other type of fake wood you will come across can in-fact not be wood at all. Using the same principle as a veneer but using a photo print of a wood grain instead - this is often called "wood effect" or something similar and also usually has a tough clear coating. You can often spot this by seeing the repetition of the grain pattern and if you look really closely you can often see the slight fuzziness of the print.

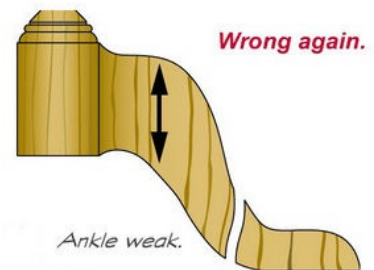
## *Strengths and weaknesses*

A piece of wood's strength is dependant upon several factors, most usually its thickness and how its grain runs.

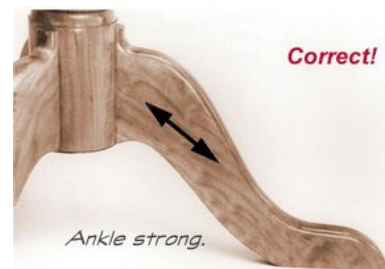
The image on the right hand side shows how with the grain running the wrong way on the of leg of a piece of furniture can be vulnerable to cracking. Wood more often than not will be vulnerable to breaking in the direction of its grain.



So it is always worth bearing in mind - where will my piece of wood be weakest? Where is it thinnest ? Does the grain run against the direction of this area or with it? (If it is against it that's good!)



The other thing to watch with a thin piece of wood is when you try to put a screw in it. If you are close to the end of a piece of wood then the screw can create a crack in the wood. If in doubt drill a hole for your screw to go down first - or try to relocate it to a place where it isn't so close to the edge.



"I cracked it what do I do now?" If it is a piece of wood that you cannot simply replace your best option is to try and glue it back together.

Different glues take different amounts of time to set - many modern glues are absolutely fantastic and often as strong as the wood was originally. The key is to make sure that when you glue it that the two parts line up neatly and are not full of dust, whilst it is drying it is best to have it firmly clamped together too so that the bond is good.

## *Without Trees We Are In Trouble*



Moai statues on Rapa Nui Island (Easter Island)

Deforestation and ecological changes due to unsustainable deforestation can be devastating for humans. A good example of this is what happened on Rapa Nui Island, which is claimed to be the down fall of the original inhabitants of the island.

One theory is that mass land clearing of the island - and possibly using tree trunks to move the Moai statues triggered irreversible change to the ecology of the island, decimating its population before colonial Europeans brought diseases there.

Trees are crucial to life on this planet, and cutting too many down is a bad idea for our atmosphere, that's why it is always important to use wood that is from a sustainable source.

Some woods are only really available as reclaimed timber as we have cut too many of them down, mahogany is one such example of this. It's always worth considering how far and where the wood you are using has come from.

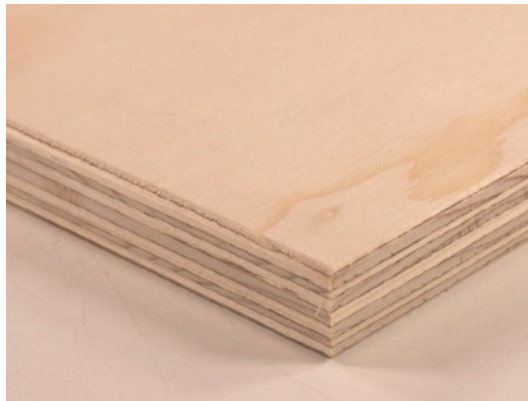


## *Flat and Strong*

Within construction the problem with wood is if its too thin it becomes too easy to break, but thanks to some great innovations we are able to use large flat pieces of wood to build with which are strong because of how the wood has been altered.

### Plywood

Remember how we were talking about wood cracking easily down its grain? Plywood beats this weakness by glueing several thin layers of wood together, with each layers grain being at 90 degrees to each other. This creates a tough thin board material, which can be used in a multitude of ways!



### Strand board and chip board

Another way of getting around the problem of the grain cracking in a piece of wood and also using up lots of low quality clippings can be seen in strand board and chip board. The difference between the two is essentially strand board has big bits and chip board has little bits.



These smaller pieces of wood are stuck together with an adhesive, making a strong and flat board that is usually used in places where its rougher texture can either be hidden or doesn't matter if it is seen.

### MDF (Medium-density fibreboard)

This wood product doesn't really look like wood at all, but is in fact made from wood broken down into fibres and stuck back together with resin, forming a dense board material with a smooth surface.



MDF is not always as strong as other board materials for constructing things as it tends to crumble a bit and is vulnerable to moisture. It does however provide a good finished surface to add other structures and veneers adhere to it with a good degree of success.

### *Don't breathe dust!*

Over the years we are learning more and more about the health effects of different materials on the human body - the simple rule is if it is making dust wear a mask!

Some board types like MDF and a lot of the hardwoods are known for having dust that is not good at all for our lungs, due to the wood or the binders and additives in them - so its best to keep the dust levels under control and if in doubt, mask up.



## *Future Wood, the “Plyscrapers”*



Sida Vid Sida, Sweden

With improvements to adhesives and abilities to make larger section of stuck together wood, the limits of what wood can be used for is changing.

With increasing demand for more green construction methods several cities have started turning to wood for sky scrapers, with this new material being fire resistant and stronger than steel in a fire it really is a future material.

The uses of wood are so numerous it is hard to imagine a world without it. In sculpture our tools are made from it - as are our installation spaces, carved sculptures, fabricated forms, plinths and even the paper in our sketchbooks.

Winchester School of Art, 2020, David Teager-Portman.

*Image sources (in order of appearance):*

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