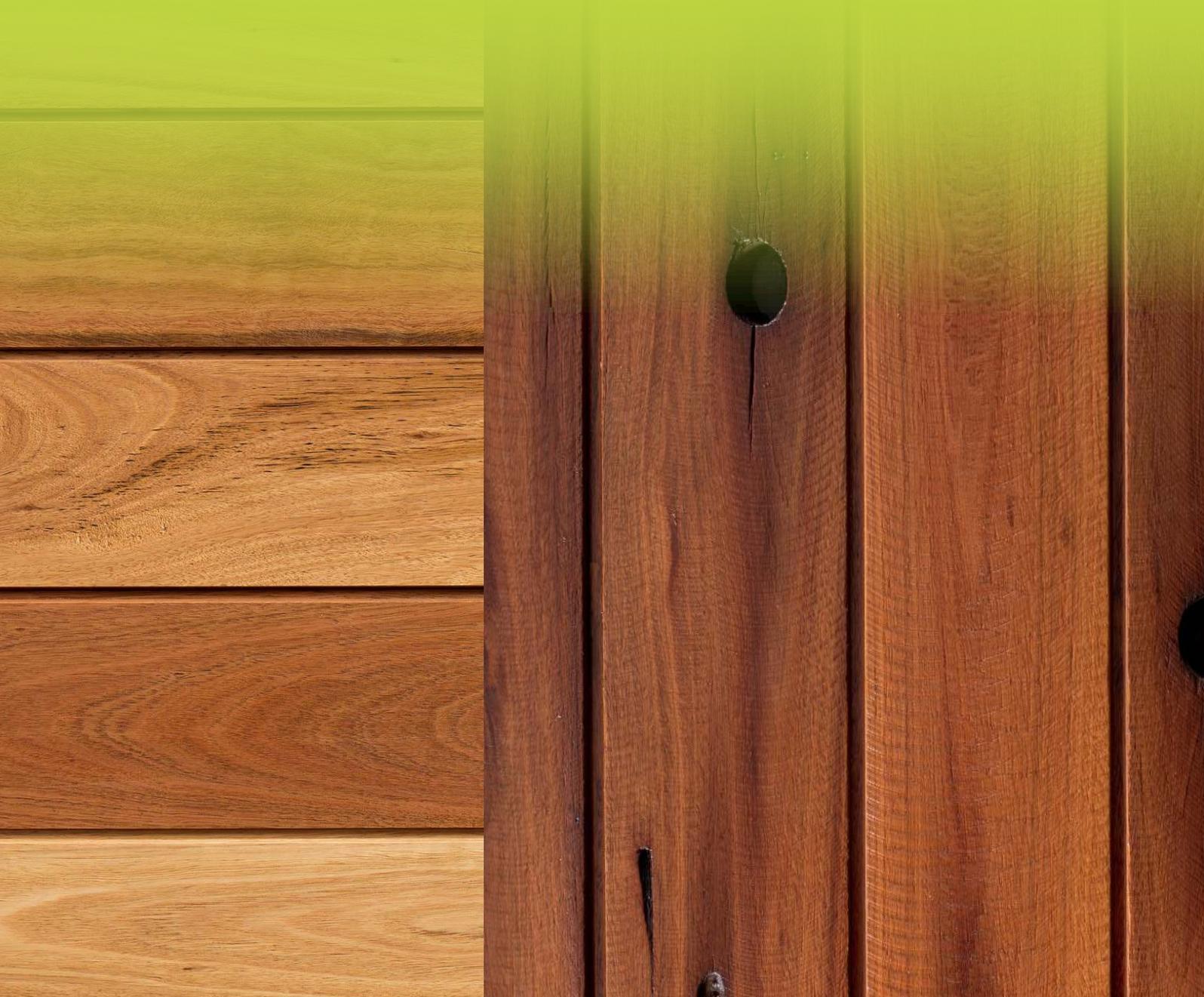


RECYCLED TIMBER VS NEW TIMBER

THE DIFFERENCES EXPLAINED





Recycled timber from **austim** is a highly specialised product.

It can be suitable for a wide range of highly decorative internal and external applications, but can also be used in applications that require a structural rating. Typically from the customer's point of view it is the "recycled look" that is important however sometimes it is the "green credentials" that is driving the decision to use recycled.

Below we will explain the differences between new timber and recycled timber and also some of the important considerations to ensure confidence when specifying or using recycled timber.

CHARACTERISTICS

Probably the most significant difference besides the obvious age differential is that recycled timber is likely to have a greater level of variation in general appearance, colour and visual characteristics.

The very nature of recycled timber and its former life dictates the level of characteristics which can vary from obvious and significant to very minimal akin to new select grade timber. It is probably also fair to say the smaller the section size (width and thickness) the less recycled characteristics that will be visible. This is due to the section most likely being cut out of larger dimensional sections and because any large bolt holes would render the smaller section of timber unusable.

By way of example, a new select grade east coast hardwood may include characteristics like minor surface checking, solid knots, tight gum veins and limited pin holes. Recycled will include similar characteristics with more leeway but in addition will also allow the inclusion of bolt holes, nail holes, natural seasoning splits and cracks and potentially other man made features.

It is however important to realise that every batch of recycled timber is likely to have come from a different source and as a result the end product will vary. This variability in recycled features from order to order or even board to board needs to be understood by all interested parties. To ensure the end customer receives what they expected what we encourage is if the customer requires a product we hold in stock we would ask them to come and view before purchasing, if however like most items it is produced to order and brought in from the East Coast we will provide the customer with as much information upfront as possible even photos where we can so there is a clear understanding of what is to be expected when the timber arrives.



Borer Holes



Surface Cracks



Natural Seasoning Cracks



Knot



Open Knots



Surface Checks



Bolt Holes



Pin/Borer Holes

COLOUR, COST & SIZES

COLOUR

When new timber is purchased colour is not a characteristic that we can select or dictate so variation is to be expected. When purchasing recycled timber colour variation, if anything, is likely to be even more pronounced because we sell it as a “blend”. For example, Recycled Ironbark Blend will include both Grey and Red Ironbark due to supply constraints and also the difficulty in definitive specie identification when timber is old and weathered. Compare this with new timber, specie identification at time of logging is definitive and throughout the sawmilling process species can be kept separate therefore colour of new timber is most likely to be comparatively more consistent.

COST

A common misconception is that recycled timber is going to be a cheap option. Unfortunately this is wrong, due to the reduced economies of scale in production, the labour intensive nature of production and the wastage when re-processing recycled timber it is typically, size for size a more expensive option than new timber. The recycled timber that Austim sells and specifies cannot be compared with what you will get down at a local salvage yard.

SIZES

At the smaller end of the scale recycled timber is generally available in much the same sizes as new timber however where larger and longer sizes are required recycled timber may be the only option for example large section posts and beams.



Spotted Gum Dressed Oiled



Grey Ironbark Dressed Raw



Blackbutt Sawn Oiled



MOISTURE CONTENT



Moisture content is a very important factor when working with timber but it can get quite technical. Below we will try and explain the importance and influence moisture content has on timber.

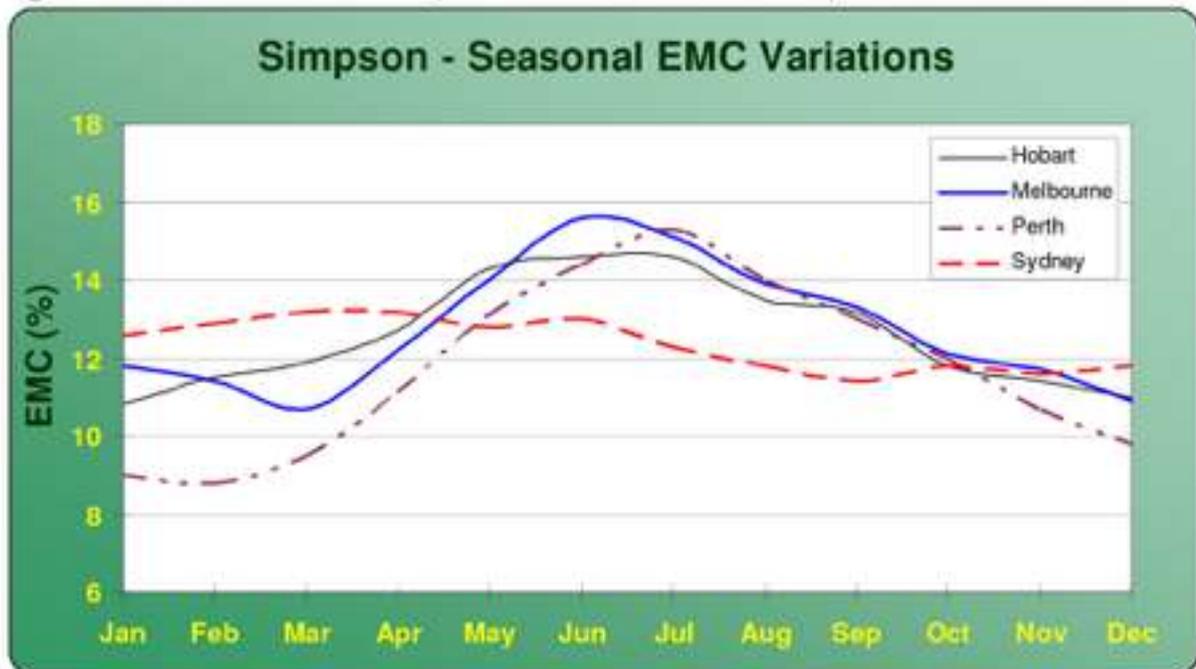
Depending on the timber specie a freshly cut log may contain between 45% and 180% water weight versus timber weight, a typical Australian hardwood might average say 70% when freshly cut, we call this percent the moisture content of the timber.

Seasoning is the process where this moisture is removed from the timber either by allowing it to slowly dry naturally in the air or by a combination of air drying and then kiln drying to speed up the seasoning or drying process. Note kiln drying is generally limited to timber boards of a thickness no greater than 50mm.

Equilibrium Moisture Content (EMC) can be explained by saying all timber will take up or release moisture to move towards equilibrium with the environment it is located in. At the point of EMC moisture will no longer be absorbed or released by the timber. EMC is influenced by humidity and temperature and can vary greatly from location to location and also from season to season, this is particularly so in Perth, of all the capital cities has the widest range of EMC throughout the year (see Simpson Diagram External Seasonal EMC Variations).

MOISTURE CONTENT

Figure 3 - EMC of wood, exposed to outdoor atmosphere



Fibre Saturation Point (FSP) is the point at which a piece of timber has lost all the “free” water in its cells, the timber still contains moisture (bound water in the cells) typically around 30% but has experienced little dimensional change up until this point.

Moving from FSP 30% to fully seasoned say 12% is where timber experiences the majority of its reduction in cell size and therefore in its dimensions.

Fully seasoned or dry timber will have achieved an average moisture content in the region of 9% to 15% which can be difficult to achieve without controlled kiln drying. The benefit of dry timbers are: greater dimensional stability, less susceptible to insect and fungal attack, improved strength and stiffness, reduced weight, will accept glue and finishes much better.

Partially air seasoned timber will have reached somewhere between 25% and 15%. Moisture release will still continue depending on the environment it is placed into and it may also develop further checking and cracking particularly if there is heart material (the very centre of the log) within the piece of timber.

MOISTURE CONTENT

To explain why recycled timber may only be partially air-seasoned you have to understand what environment it was in during its prior life and for how long. For example a bridge or wharf girder has been in a coastal environment sitting in or above water where the equilibrium moisture content is probably around 20%. Or the example where a power pole has been recycled but only after 5 years in service and part of the pole was in the ground. In this example there will likely be variability along the length of the timber cut out of this pole, but even the above ground portion would not have reached EMC after just 5 years. Potentially a 300mm diameter pole could take 20+ years to naturally reach its environments EMC of say 14-16% outdoors in QLD.

New timber from Austim is most typically sold as fully seasoned via kiln drying with moisture content of between 9% and 14. From time to time we may supply freshly cut green Jarrah or Karri but it is very application dependant typically structural as opposed to decorative.

Recycled timber if sawn thickness is 50mm or below will be kiln dried and it will also have a moisture content of 9-14%. Bearing in mind in Perth some in service movement should still be expected depending upon the EMC variability of the environment it is being put into.

Where more awareness and consideration is warranted is with larger thickness sections of recycled timber that we classify as "partially air seasoned". This material may have been cut out of old power poles or large bridge girders as opposed to old joists and rafters. As these timbers are brought into Perth's environment they will continue to release moisture continuing the seasoning process which means drying out but also shrinking and potentially checking and cracking as the timber moves towards EMC.

To help the timber through this drying process we would strongly recommend at least an initial application of a penetrating oil which we can apply in our factory, other things to consider would be placing straps around timber posts to contain end splits and other appropriate allowances for shrinkage at joints and junctions (careful detailing is necessary), note if the timber is not to be installed immediately then it should be stored out of direct sun in a weather protected area.

To quantify what can happen if we take a piece of Spotted Gum cut green at 300mm wide by 75mm thick by the time it is fully seasoned it has potentially shrunk by between 4% and 8% which could equate to 24mm in the width of the timber and maybe 5mm in thickness.

If recycled timber is re-cut to 300mm by 75mm when it is partially air seasoned you could still see shrinkage 3% to 5% so possibly 15mm in width and 3-4mm in thickness.

Fully seasoned timber can and will still exhibit change in its dimensions, some timbers less than others, understanding and allowing for such movement is an important part of timber design and specification.

FINISH

We offer recycled timber in four different finishes, some more suited to particular applications than others.

We recommend the hand brushed finishes in external applications because they take coatings better and tend to hide surface checking better than a dressed finish. Internally either a dressed or hand brushed finish work well.

DRESSED

A moulding machine produced smooth finish providing precise sizing, note sanding may still be required.

DRESSED AND HAND BRUSHED

A moulding machine produced smooth finish providing precise sizing but which is then given some texture by hand brushing to one or all faces. Our most popular finish.

SAWN AND HAND BRUSHED

A bandsaw or circular saw produced rough finish (could be either freshly sawn or sawn many years ago), some variation in sizing evident, then hand brushed to remove loose timber fibres.

SAWN

a bandsaw or circular saw produced rough and inconsistent finish, some variation in sizing evident, might be used where appearance is not critical or timber is not visible for example large structural decking bearers and joists.



Dressed



Sawn



Hand Brushed

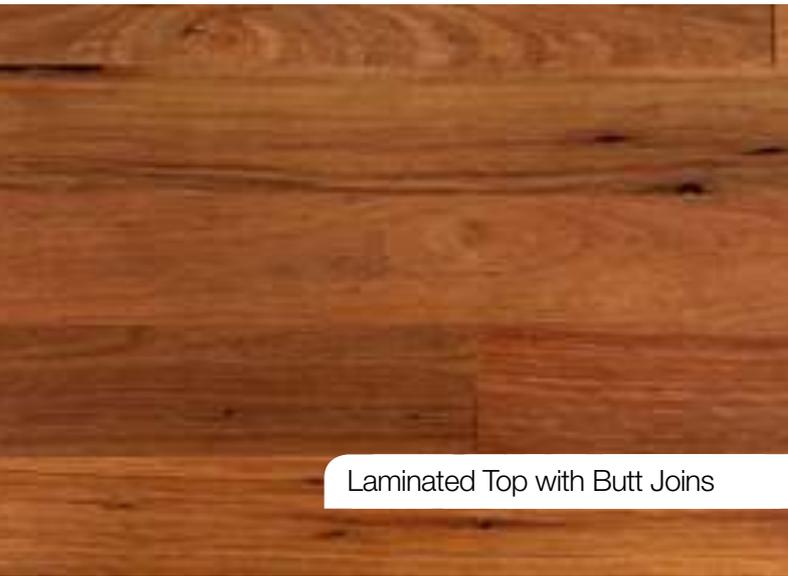
RESIN FILL

One option when considering recycled timber is to have bolt holes, nail holes and other larger voids such as splits and knots black resin filled.

This comes down to personal preference around the aesthetics however you should note that we only recommend resin filling on kiln dried material, filling partially air seasoned timber is problematic because the resin may loosen over time as the timber contracts and shrinks as it settles to EMC.

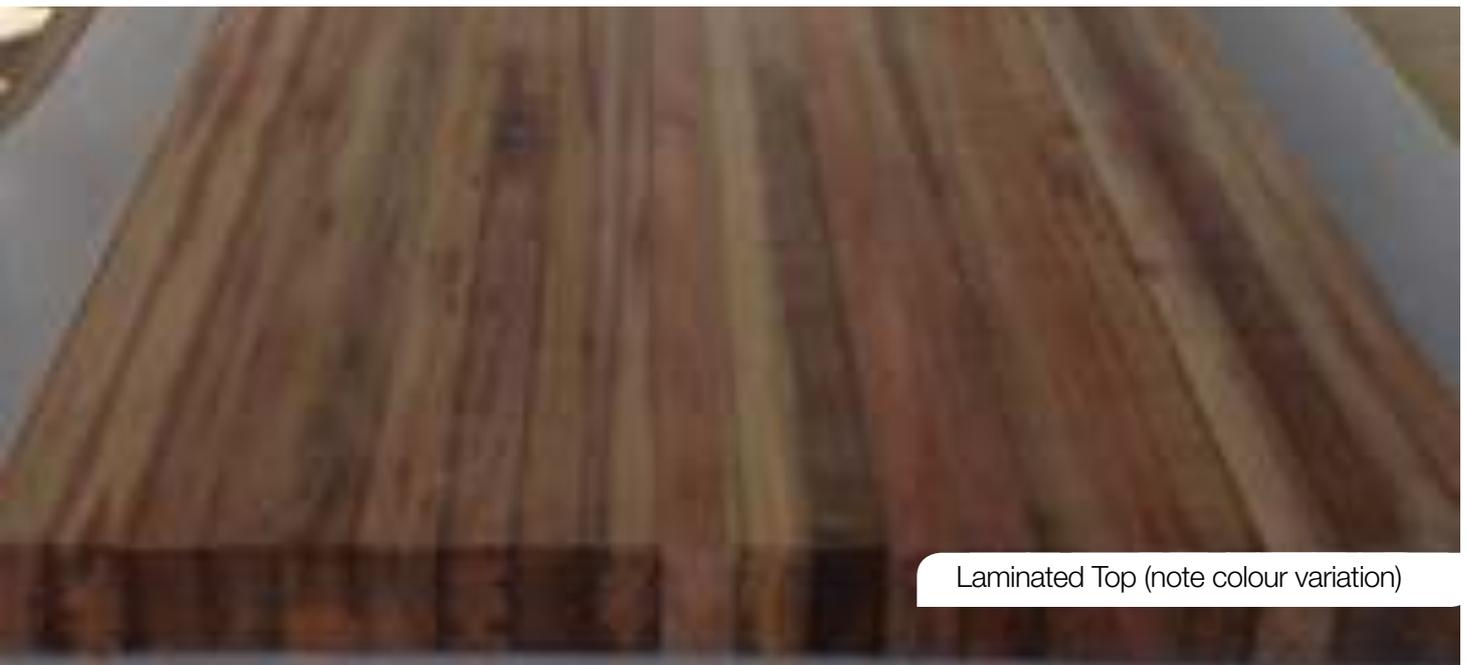


LAMINATING



Laminated Top with Butt Joins

The gluing of boards together to form a larger/wider section is common practice, we will only provide something like this if sizing allows it to be produced from kiln dried material. Trying to glue up partially air seasoned material is problematic. Suitable applications for a laminated top or beam are internal uses or if to be used externally then only in situations where they are used in a vertical orientation. (ie not suitable for external stair treads or table tops where the wide horizontal surface is likely to collect and hold water). Note that colour variation will be evident regardless of specie.



Laminated Top (note colour variation)

TANNIN BLEED

Tannins in timber are water soluble extractives that get released or washed (leached out) out when the timber is exposed to water or rain.

This can cause unsightly staining to surrounding structures for example light coloured paving below a timber pergola.

Another example of potential staining situations is wall cladding run-off both vertical and horizontal like on a two story house with a rendered bottom level. This leaching will eventually cease as all the extractives are released but this could take a full wet season. Not all timbers leach but the majority of hardwoods do to some degree. The recycled timbers such as Ironbark will and to a lesser extent Spotted Gum and Blackbutt. Yes, unusual as it sounds recycled timber will still leach tannins particularly so if the timber has been cut from larger sections which it often is. Careful design detailing can help limit potential staining of adjacent surfaces, we also find that fully coating the timber with a good quality penetrating oil or paint paying particular attention to seal any freshly cut ends can almost eliminate any leaching. Note : Austim can offer alternative products for your consideration if tannin leaching is an un-acceptable risk to your project.





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