

# Meyer TIMBER®

## TIMBER MOVEMENT THROUGH MOISTURE AND EXPOSURE

Structural timber that is left unrestrained and exposed to the elements for extended periods of time is subject to an increased probability of movement or distortion due to changes in moisture content. This can include shrinkage, swelling, twisting, spring, and bow. This factsheet will focus on softwood materials as they account for most of the issues around moisture movement, with the figures related specifically to Radiata Pine. Other softwood species will react in a similar way.

The moisture content within a tree consists of two separate items; water within the actual cell walls, and 'free' water within the cells. The free water is the first to evaporate during drying, but this doesn't affect the dimensions at all. Once all this water is removed the timber is at a moisture content called fibre saturation point (FSP). For Radiata Pine this is approximately 29%. Below this, water is removed from the cell walls themselves and the timber shrinks as the moisture content reduces. This is taken linearly from the FSP to 3% and in Radiata Pine occurs tangentially (across the grain) at 0.27% per % moisture difference. Structural pine and LVL is usually supplied at moisture contents of between 8-15%, and ambient conditions in NSW and VIC hover around the 9-12% range.

Now let's put this into context. Take a piece of 300x45 meySPAN13 delivered to site at 9% moisture content. If this is left uncovered and allowed to change in moisture content to say 19% (which is not uncommon) the size increase will be  $10 \times 0.27 = 2.7\%$ . The depth of this 300mm beam is now 308mm. Once the timber is able to dry out it should return towards original dimensions. This means if a builder installs the timber wet and planes it down to the right size, it will shrink as it dries out and end up undersize.

If this piece of meySPAN13 is within a pack left uncovered, the moisture content may rise to 19%, making the depth 308mm. As the sun shines on the pack, the top face will dry out quicker and try and shrink back to 300mm whilst the bottom face within the pack is still wet and at 308mm. Cupping is the eventual result.

Remediation of timber that has 'swelled' only is usually achieved by putting the timber undercover and well ventilated to allow it to return to ambient moisture content and dimensions. Depending on the size of the piece and current weather, this could take a week or two. If exposed to very high moisture content variations there will be internal stresses created and the timber may not return all the way back to its original dimensions. When any distortion such as cupping, twist, spring, or bow are evident the process is a bit more hit and miss. By placing the timber under pressure whilst drying (to 'help' it to move back into original position) you may get a better result, but at the same time you need to allow the wood to balance its moisture profile. Whatever you do or suggest, it is beneficial not to speed the process up too much. Remember, the tree has spent over 30 years growing. The longer you allow the fibres to naturally re-align as the size changes, the better the end result will be.

The most important item is to protect timber, both for builders and suppliers. You can try to minimise any dimensional changes after the fact, but this will take time and level of success is variable. It is much easier to prevent the issues occurring by:

- ◉ Ideally, move all timber that is stored for extended periods of timber under cover to prevent moisture changes.
- ◉ If outside, cover timber to protect against moisture whilst allowing ventilation (raised off the ground). Without ventilation, condensation can build up within the packaging and increase the moisture content of the pack.
- ◉ Strap up loose packs as this limits the amount of moisture change (if covered) and prevents movement of individual sticks.
- ◉ If laminating pieces of timber or LVL together place elastomeric adhesive between the laminations to prevent water becoming trapped. See Lamination of meySPAN flyer for more details.

*George and Afzal*



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