

Results

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Dean,

LONG TERM DIMENSIONAL STABILITY

Method

Long term dimensional stability is a situation where timber is exposed to wet conditions, and then exposed to dry conditions. An example of this situation is exposure of exterior joinery to wet winter conditions for four months and then exposure to summer conditions for four months. Another example is where timber is installed at the incorrect moisture content and dries out after installation. Long term movement is dependent on the equilibrium moisture content (emc) and shrinkage properties of the wood. Long term movement is expressed as a percentage of movement when the moisture content changes from equilibrium at 85% RH to equilibrium at 35% RH.

Samples from each of the three species supplied (Eucalyptus Nitens, American White Oak, and Tasmanian Oak) were prepared into samples which are 70 mm wide, 50 mm long and 10 mm thick. Note the Eucalyptus Nitens and Tasmanian Oak samples were quarter sawn, while the American White Oak specimens were flat sawn.

Long term movement was assessed by equalising standard sized samples in conditions of 25°C and 85% relative humidity. When the samples were at equilibrium (determined by having a stable mass) the samples are weighed and width and length were measured. The samples are then exposed to conditions of 25°C and 35% relative humidity and when the samples again reached equilibrium they are weighed and the width and length remeasured. The difference between the two width measurements is calculated as a percentage of the width in the 35% humidity conditions. The classification system is shown below (Anon, 1976).

Class	Sum of percentage radial and tangential movements (%)
Small	< 3.0
Medium	3.0 – 4.5
Large	>4.5

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Long term dimensional stability Test results

Species	25°C 85%Rh		25°C 35%Rh		Percentage Change	
	Average length (mm)	Average Width (mm)	Average length (mm)	Average Width (mm)	Average Length (%)	Average Width (%)
Eucalyptus Nitens	50.038	72.832	50.002	71.255	0.07	2.21
American White Oak	50.073	73.672	50.049	71.384	0.05	3.21
Tasmanian Oak	50.010	72.679	49.987	71.199	0.05	2.08

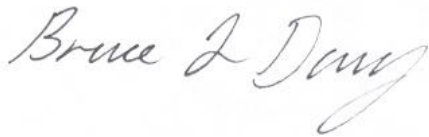
Note; American White oak was flat sawn – hence Changes of width are in the radial dimension Eucalyptus Nitens and Tasmanian Oak were quarter sawn – hence changes of width are in the tangential direction.

Specimens are currently stored in the 25°C 35%Rh room pending short term dimensional stability tests (24 hours at the higher MC) if required.

REFERENCES

Anon, 1976; The movement of timbers. Technical note No. 38. Princes Risborough Laboratory, Building Research Establishment.

Regards



Bruce Davy