



Strength and Stiffness of Fibre7 Solidwood

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Strength

Strength is concerned with safety. How strong is the timber? At what load will timber fail? The strength is essentially the stress at which it fails. The failure stress is usually called the Modulus of Rupture (MoR). An average value would assume half the material fails, so a factored design or safe value is required. Typically a 5th %-ile lower boundary is used and factored for load duration effects and safety.

Stiffness

Stiffness is a measurement of how far the timber deflects when it is loaded. The stiffness of a material is expressed using the elastic modulus (E or MoE). For design, an average value is usually used, and variation about this average is 20%.

Table shows modules of rupture and modules of elasticity

Sample	Density	Hardness	MOR	MOE
	kg/m ³	kN	MPa	MPa
Lignia	1 736	5.8	78	5880
	2 791	7.2	125	10700
	3 769	6.6	79	5420
Mean	765	6.5	94	7333



Dimensional Stability of Fibre7 Solidwood

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Dimensional stability is a measure of how much a solid board will move with changing humidity levels. All types of timbers move with moisture levels to varying degrees.

Lignia solidwood has been tested by the Forest Research Institute of New Zealand to the British Building Research Establishment (BRE) Technical Note No. 38. The test yields a percentage movement in both the tangential and radial directions for humidity levels of 60% and 90%.

	Tangential Movement %	Radial Movement %
Solid board of Lignia	1.5	0.4
Tasmanian Oak	2.9	1.8
European Oak	2.5	1.5
European Beech	1.8	1.7
Teak (Burma)	1.2	0.7
Black Walnut (American)	3.5	2.5
Cherry (European)	2.0	1.2