

## BASIC STRENGTH PROPERTIES OF COCONUT (*COCOS NUCIFERA*) TIMBER

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In Sri Lanka 1.15 million coconut trees are being uprooted annually under replanting schemes. Most of them are used as cheap timber (i.e. rafters, fence posts etc.) and the portion unsuited for timber is used as a fuelwood in tile and brick kilns. A mature tree (over 55 years old) depending on its height and diameter, gives 0.75-1.0 m<sup>3</sup> of usable timber of which the density is above 500 kg/m<sup>3</sup>. As the first step in the better utilization of coconut timber, its position and properties among other common timbers were investigated.

Four basic tests such as compressive strength test parallel to grain, shear strength test parallel to grain, static bending test perpendicular to grain and impact bending test perpendicular to grain, were carried out for 'tall' variety which is the most common in Sri Lanka. All the samples were seasoned for 3½ months and the moisture content was kept in between 16%-17% during the tests.

Coconut trunk of a tall palm around 60 years gave the following physical characteristics when tested between 0 - 14.4 meters in height.

	<i>Minimum</i>	<i>Maximum</i>
Density	290 kg/m <sup>3</sup>	940 kg/m <sup>3</sup>
Crushing strength (compression) (parallel to grain)	25.8 MPa	111.7 MPa
Shear stress (parallel to grain)	2.2 MPa	15.6 MPa
Equivalent fibre stress at maximum load (static bending)	50 MPa	114.4 MPa

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	<i>Minimum</i>	<i>Maximum</i>
Modulus of elasticity	6.3 GPa	14.1 GPa
Impact bending—height of release for 1.5 kg weight	0.2 m	1.7 m

A linear relationship in between density and other strength properties were noted.

### *References*

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