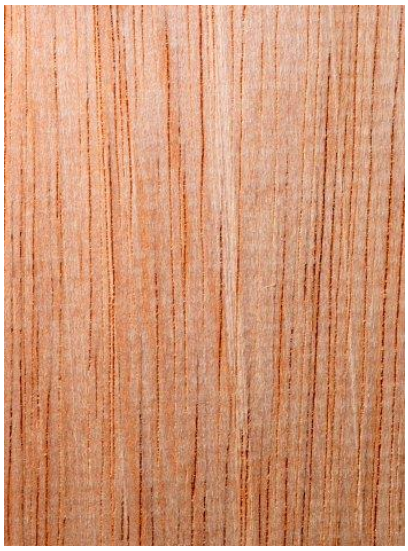
Durian



INTRODUCTION

The Standard Malaysian Name for the timber of *Coelostegia spp., Durio spp., Kostermansia* sp. and *Neesia* spp. (Bombacaceae). Vernacular names applied include *durian* (Peninsular Malaysia, Sabah and Sarawak) with various epithets as well as other localised names too numerous to list here. Major species include *Coelostegia borneensis, C. griffithii; Durio carinatus, D. grandiflorus, D. graveolens, D. lowianus, D. malaccensis, D. oxleyanus, D. singaporensis, D. wyatt-smithii, D. zibethinus; Kostermansia malayana; Neesia altissima, N. kostermansiana, N. malayana and N. synandra.* The sapwood is almost white in *Durio*, pale yellow in *Neesia* and light orange-yellow in *Coelostegia* and is sharply defined in *Durio* and *Neesia* but only moderately sharply defined in *Coelostegia*, from the heartwood, which is pink-brown, grey-brown, brown with a red tinge or light orange-brown.

Also known as Durian (Brunei); Bengang, Durian, Durian hantu, Ki bengang and Sibengang (Indonesia); Durian (Philippines); and Chang haek and Turian (Thailand).

DENSITY

Durian is a Light Hardwood with a density of 420-865 kg/m^3 air dry.

NATURAL DURABILITY

Four species of *durian* were tested for their durability by the standard graveyard test and the results indicated that *durian* timbers are not durable if exposed to natural Malaysian weather conditions. The test samples with dimension of 50 mm x 50 mm x 600 mm were destroyed in a relatively short period of time, for example, *Neesia altissima* (1.5 years), *Durio lowianus* (1.7 years) and *Coelostegia griffithii* (1.5 years) (Mohd Dahlan Jantan *et. al.,* 1987).

However, it should be stressed here that the above durability ratings are only applicable to Malaysia where termites are common and fungi are very active throughout the year. In temperate countries, however, the threat of 'infestation' by both insects and fungi are very much reduced and the durability of the timber will be greatly extended.

PRESERVATIVE TREATMENT

It is easy to treat with preservatives.

TEXTURE

Texture is moderately coarse to coarse and even in *Neesia* but uneven in *Durio* and *Coelostegia*, with straight to slightly interlocked grain.

STRENGTH PROPERTIES

The timber falls into Strength Group C (Engku, 1988b) or SG 6 (MS 544:Part 2:2001).

Strength Properties of Durian

Species	Test Condition	Modulus of Elasticity (MPa)	Modulus of Rupture (MPa)	Compression parallel to grain (MPa)	Compression perpendicular to grain (MPa)	Shear Strength (MPa)
C. griffithii	Green	14,300	71	38.5	4.00	8.3
	Air dry	15,800	95	53.9	5.65	9.2
D. oxleyanus	Green	10,600	55	27.4	2.96	7.2
	Air dry	11,700	74	39.0	4.14	8.0
N. altissima	Green	8,600	51	26.5	2.59	5.9
	Air dry	9,500	65	32.5	2.72	6.8

MACHINING PROPERTIES

It is easy to slightly difficult to resaw and easy to difficult to cross-cut. Planing is easy to moderately easy and the planed surface is smooth to moderately smooth and sometimes even rough, especially in the radial boards.

Machining Properties of Durian

Species	Test Condition	Sawing		Planing		Boring		Turning	
		Re-sawing	Cross Cutting	Ease of planing	Quality of finish	Ease of boring	Quality of finish	Ease of turning	Quality of finish
C. griffithii	Green	fairly easy	difficult	easy	moderately smooth	slightly difficult	moderately smooth	-	-
	Air dry	slightly difficult	difficult	moderately easy	moderately smooth	slightly difficult	moderately smooth	slightly difficult	moderately difficult
D. oxleyanus	Green	easy	easy	easy	smooth	easy	fairly smooth	-	-
	Air dry	easy	easy	easy	smooth	easy	fairly smooth	easy	rough
D. zibethinus	Green	easy	easy	easy	moderately smooth	easy	moderately smooth	-	-
	Air dry	-	-	-	-	-	-	-	-
N. altissima	Green	easy	easy	easy	rough, especially radial	easy	rough	-	-
	Air dry	-	-	-	-	-	-	-	-

NAILING PROPERTY

Nailing property ranges from good to excellent.

AIR DRYING

Seasoning properties vary according to species, which are summarised as follows:

Species	Time to air dry (months)		Remarks
	13 mm thick boards	38 mm thick boards	
C. griffithii	2.5	3.5	Moderately fast drying; moderate staining; slight dimensional movement and splits; shrinkage low.
D. oxleyanus	3	4	Fairly slow drying; moderate insect attack; slight cupping; shrinkage high.
N. altissima	1.5-2	3-4	Moderately fast drying; slight end-checking and splitting; average shrinkage.

KILN-DRYING

Kiln Schedule D is tentatively recommended for the drying of *durian* timbers. The timber of *durian* can be kiln-dried at a moderately fast rate with only slight twisting except for the timber of *D. oxleyanus,* which requires up to 1.5 months to dry boards of 70 mm x 127 mm with variable lengths. It is also recommended that sawn timber of *durian* be air dried for a minimum period of 2 weeks before being kiln-dried to save on cost.

Kiln Schedule D

Moisture Content (%)	Temperature (Dry Bulb)		Temperature (Wet Bulb)		Relative Humidity (%) (approx.)
	F	C	F	C	
Green	105	40.5	101	38.0	85
60	105	40.5	99	37.0	80
40	105	40.5	96	35.5	70
35	110	43.5	97	36.0	60
30	115	46.0	97	36.0	50
25	125	51.5	101	38.0	40
20	140	60.0	105	40.5	30
15	150	65.5	112	44.5	30

SHRINKAGE

Shrinkage varies according to species, which are summarised as follows:

Species	Shrinkage (%) (Green to air dry)	
	Radial	Tangential
C. griffithii	1.3	1.6
D. oxleyanus	2.4	4
N. altissima	1.3	2.4

MOVEMENT IN SERVICE

The movement of seasoned timber is classified under Type IV.

DEFECTS

The logs of all the timber producing species of the Bombacaceae are normally sound and free of defects except for a small area of sponginess around the pith, and damage by ambrosia and, occasionally, longicorn beetles. An area of 2 to 3 inches (51 to 76 mm) of sponginess has been observed in logs of *Durio* spp. and *Neesia altissima* but the compression failures usually associated with this type of defect have not been encountered. The timber of species of *Durio* contains abundant starch, and, although not very susceptible to sap stain, is liable to attack by all forms of wood-boring insects and to heavy infestation by Lyctus. On the other hand, the limited amount of material of *N. altissima* that has been examined contained very little starch and was attacked only by a small number of pin-hole borers.

USES

The timber is suitable for light construction under cover, flooring, door and window frames, panelling, mouldings, partitioning, planking, joinery, cabinet making, furniture, cooling tower (non-structural purposes), railway sleepers, pallets (expendable type), plywood, joists (for light construction only), wooden sandals and low grade coffins.