

Family: SAPOTACEAE (angiosperm)

Scientific name(s): Manilkara bidentata

Manilkara huberi

Commercial restriction: no commercial restriction

WOOD DESCRIPTION

Color: red brown
 Sapwood: clearly demarcated
 Texture: fine
 Grain: straight
 Interlocked grain: absent
 Note: Dark red brown with purplish shades.

LOG DESCRIPTION

Diameter: from 60 to 120 cm
 Thickness of sapwood: from 4 to 6 cm
 Floats: no
 Log durability: good

PHYSICAL PROPERTIES

Physical and mechanical properties are based on mature heartwood specimens. These properties can vary greatly depending on origin and growth conditions.

	<u>Mean</u>	<u>Std dev.</u>
Specific gravity *:	1,10	0,05
Monnin hardness *:	12,9	2,1
Coeff. of volumetric shrinkage:	0,75 %	0,06 %
Total tangential shrinkage (TS):	9,4 %	0,8 %
Total radial shrinkage (RS):	7,1 %	0,8 %
TS/RS ratio:	1,3	
Fiber saturation point:	27 %	
Stability:	poorly stable	

MECHANICAL AND ACOUSTIC PROPERTIES

	<u>Mean</u>	<u>Std dev.</u>
Crushing strength *:	89 MPa	8 MPa
Static bending strength *:	170 MPa	18 MPa
Modulus of elasticity *:	24410 MPa	3274 MPa

(*: at 12% moisture content, with 1 MPa = 1 N/mm²)

Musical quality factor: 107,7 measured at 2842 Hz

NATURAL DURABILITY AND TREATABILITY

Fungi and termite resistance refers to end-uses under temperate climate. Except for special comments on sapwood, natural durability is based on mature heartwood. Sapwood must always be considered as non-durable against wood degrading agents.

E.N. = Euro Norm

Funghi (according to E.N. standards): class 1 - very durable

Dry wood borers: durable - sapwood demarcated (risk limited to sapwood)

Termites (according to E.N. standards): class D - durable

Treatability (according to E.N. standards): class 4 - not permeable

Use class ensured by natural durability: class 4 - in ground or fresh water contact

Species covering the use class 5: Yes

Note: This species naturally covers the use class 5 (end-uses in marine environment or in brackish water) due to its high specific gravity and hardness.

According to the European standard NF EN 335, performance length might be modified by the intensity of end-use exposition.

REQUIREMENT OF A PRESERVATIVE TREATMENT

Against dry wood borer attacks: does not require any preservative treatment

In case of risk of temporary humidification: does not require any preservative treatment

In case of risk of permanent humidification: does not require any preservative treatment

DRYING

Drying rate: slow

Risk of distortion: high risk

Risk of casehardening: yes

Risk of checking: high risk

Risk of collapse: no

Note: Surface drying prior to kiln drying is recommended.

Possible drying schedule: 5

M.C. (%)	Temperature (°C)		Air humidity (%)
	dry-bulb	wet-bulb	
30	42	41	94
25	42	39	82
20	48	43	74
15	48	43	74

This schedule is given for information only and is applicable to thickness lower or equal to 38 mm.

It must be used in compliance with the code of practice.

For thickness from 38 to 75 mm, the air relative humidity should be increased by 5 % at each step.

For thickness over 75 mm, a 10 % increase should be considered.

SAWING AND MACHINING

Blunting effect: fairly high

Sawteeth recommended: stellite-tipped

Cutting tools: tungsten carbide

Peeling: not recommended or without interest

Slicing: nood

Note: Requires power.

ASSEMBLING

Nailing / screwing: good but pre-boring necessary

Gluing: correct (for interior only)

Note: Gluing requires care (very dense wood).

COMMERCIAL GRADING

Appearance grading for sawn timbers: According to NHLA grading rules (January 2007)

Possible grading: FAS, Select, Common 1, Common 2, Common 4

In French Guiana, the local name of this species is "BALATA FRANC". Grading is done according to local rules "Bois guyanais classés".

Possible grading: Choix 1, choix 2, choix 3, choix 4

FIRE SAFETY

Conventional French grading: Thickness > 14 mm : M.3 (moderately inflammable)

Thickness < 14 mm : M.4 (easily inflammable)

Euroclasses grading: D s2 d0

Default grading for solid wood, according to requirements of European standard EN 14081-1 annex C (April 2009). It concerns structural graded timber in vertical uses with mean density upper 0.35 and thickness upper 22 mm.

END-USES

Hydraulic works (fresh water)

Sleepers

Stakes

Sliced veneer

Ship building (planking and deck)

Sculpture

Turned goods

Industrial or heavy flooring

Stairs (inside)

Bridges (parts not in contact with water or ground)

Note: In Brazil, *M. elata* and *M. longifolia* are used for pulpwood.

Bridges (parts in contact with water or ground)

Poles

Wood frame house

Stringed instruments (bow)

Arched goods

Tool handles (resilient woods)

Shingles

Heavy carpentry

Current furniture or furniture components

MAIN LOCAL NAMES

<u>Country</u>	<u>Local name</u>	<u>Country</u>	<u>Local name</u>
Brazil	MAÇARANDUBA	Brazil	MAPARAJUBA
Brazil	PARAJU	Colombia	BALATA
Colombia	NISPERO	Guyana	BALATA
Guyana	BEEFWOOD	Guyana	BULLET WOOD
French Guiana	BALATA FRANC	French Guiana	BALATA GOMME
French Guiana	BALATA ROUGE	French Guiana	BOIS ABEILLE
Panama	NISPERO	Peru	PAMASHTO
Peru	QUINILLA COLORADA	Suriname	BOLLETRIE
Venezuela	BALATA	Venezuela	MASSARANDU
United Kingdom	BULLET WOOD	United States of America	BEEFWOOD
United States of America	BULLET WOOD		

