SANDE

Family: MORACEAE (angiosperm)
Scientific name(s): Brosimum utile
Brosimum parinarioides
Brosimum potabile
Commercial restriction: no commercial restriction
Note: SANDE refers to light coloured Brosimum species.

WOOD DESCRIPTION

Color: light brown
Sapwood: not demarcated
Texture: medium
Grain: interlocked
Interlocked grain: slight

LOG DESCRIPTION

Diameter: from 70 to 90 cm
Thickness of sapwood:
Floats: yes
Log durability: low (must be treated)

Note: Heartwood varies from greyish white to light brown with golden shades. Sometimes internal stresses.

PHYSICAL PROPERTIES

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

	Mean	Std dev.
Specific gravity *:	0,69	0,05
Monnin hardness *:	3,5	1,0
Coeff. of volumetric shrinkage:	0,59 %	0,03 %
Total tangential shrinkage (TS):	8,2 %	1,3 %
Total radial shrinkage (RS):	5,8 %	1,1 %
TS/RS ratio:	1,4	
Fiber saturation point:	28 %	

Stability: poorly stable

MECHANICAL AND ACOUSTIC PROPERTIES

	Mean	Std dev.
Crushing strength *:	64 MPa	7 MPa
Static bending strength *:	95 MPa	10 MPa
Modulus of elasticity *:	16380 MPa	2170 MPa

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

Musical quality factor: 115,5 measured at 2728 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 5 - not durable
Dry wood borers: susceptible - sapwood not or slightly demarcated (risk in all the wood)
Termites (according to E.N. standards): class S - susceptible
Treatability (according to E.N. standards): class 1 - easily permeable
Use class ensured by natural durability: class 1 - inside (no dampness)
Species covering the use class 5: No
Note: Prone to blue stain.

REQUIREMENT OF A PRESERVATIVE TREATMENT

Against dry wood borer attacks: requires appropriate preservative treatment
In case of risk of temporary humidification: requires appropriate preservative treatment
In case of risk of permanent humidification: use not recommended

DRYING

Drying rate: normal
Risk of distortion: slight risk
Risk of casehardening: no
Risk of checking: no risk or very slight risk
Risk of collapse: no
Note: The risks of distortion increase in presence of highly interlocked grain; in this case, air drying is recommended.

Possible drying schedule: 3

M.C. (%)	Temperature (°C) dry-bulb	wet-bulb	Air humidity (%)
Green	60	56	81
30	68	58	61
20	74	60	51
15	80	61	41

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: normal
Sawteeth recommended: ordinary or alloy steel
Cutting tools: ordinary
Peeling: good
Slicing: nood
Note: Some difficulties in presence of internal stresses (overheating of sawblades) and highly interlocked grain. Keep sharp tools.

ASSEMBLING

Nailing / screwing: good
Gluing: correct

COMMERCIAL GRADING

Appearance grading for sawn timbers: According to NHLA grading rules (January 2007)
Possible grading: FAS, Select, Common 1, Common 2, Common 3

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.

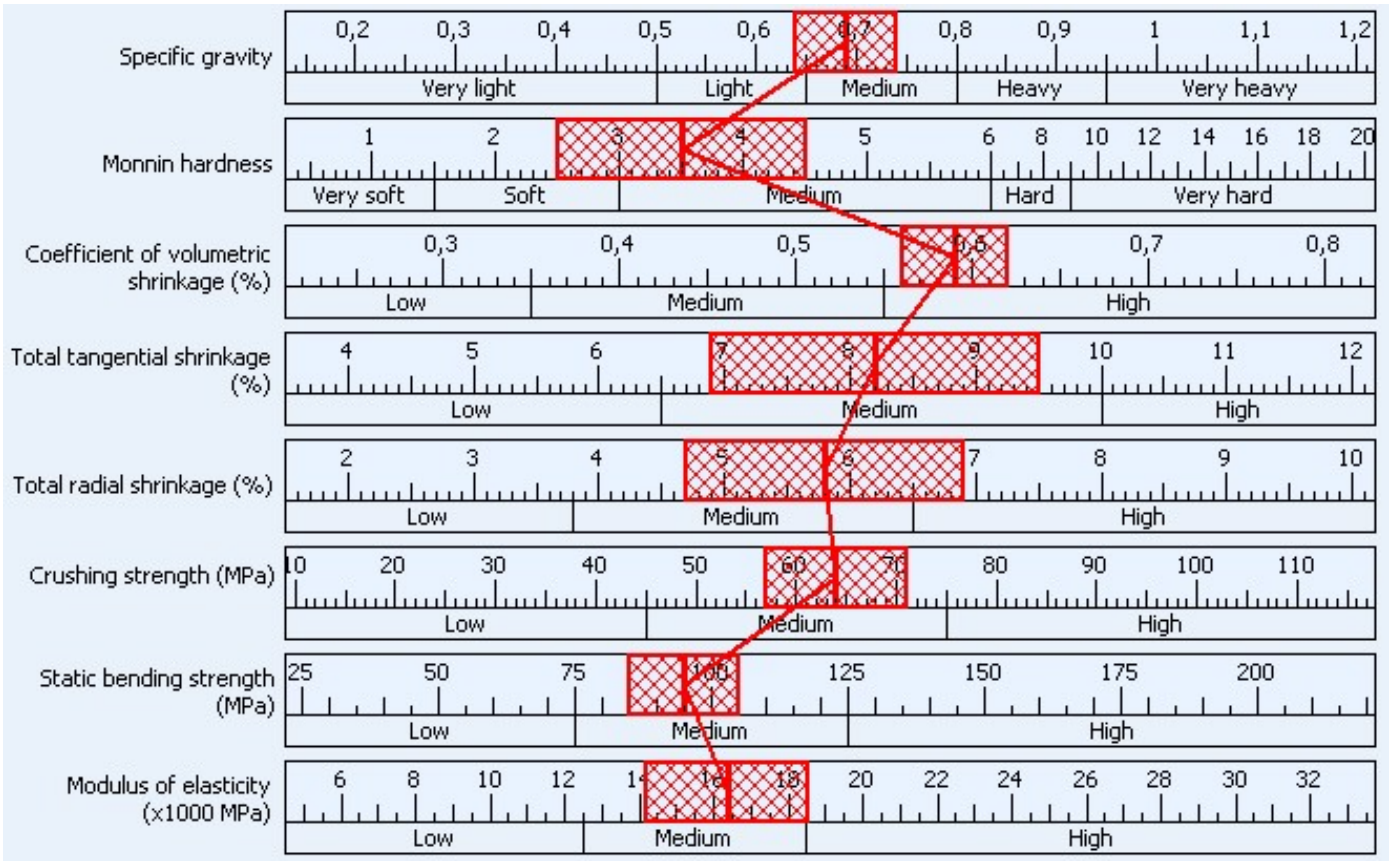
END-USES

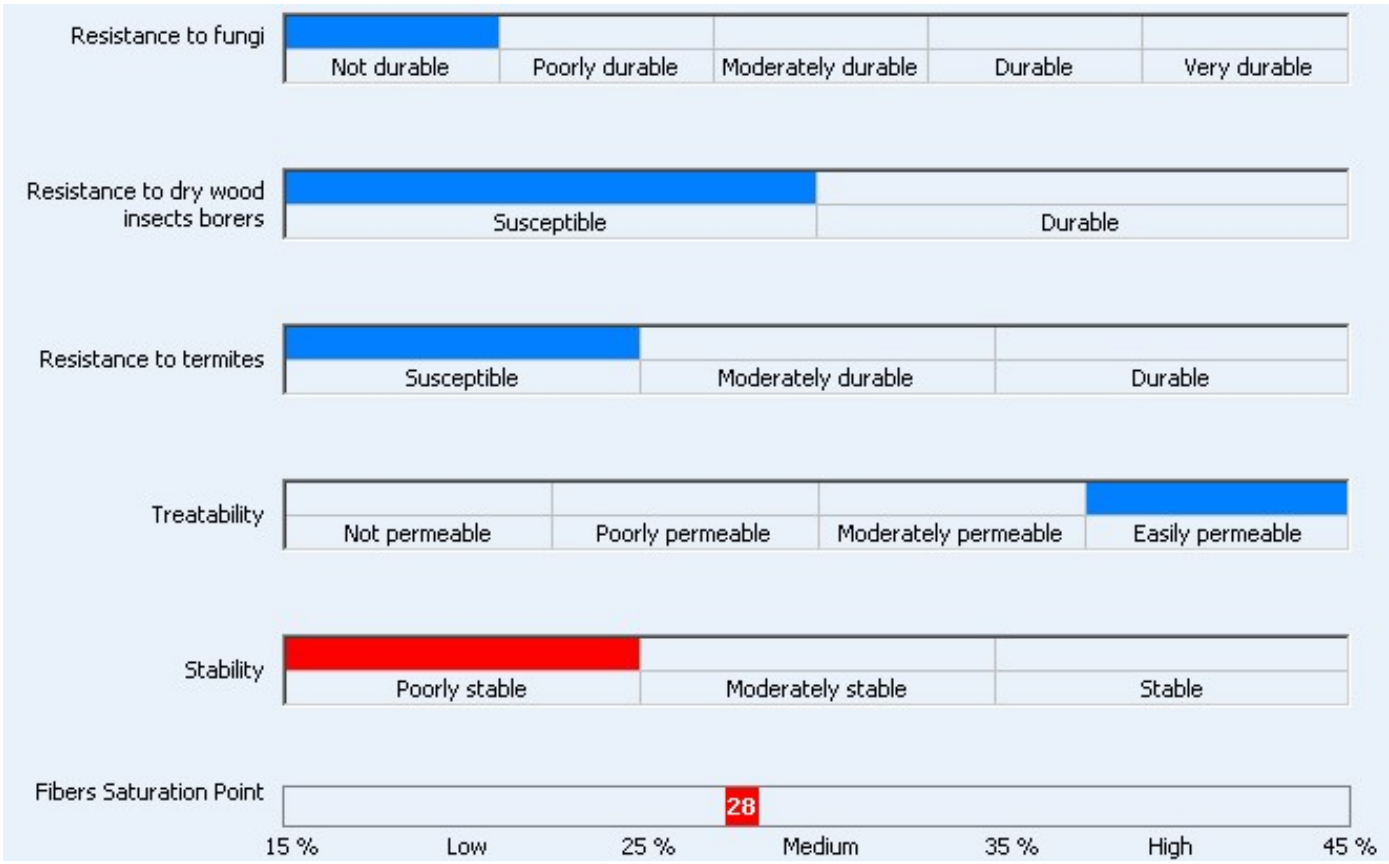
Veneer for interior of plywood
Current furniture or furniture components
Interior joinery
Fiber or particle boards
Light carpentry
Sliced veneer
Veneer for back or face of plywood
Boxes and crates
Moulding
Interior panelling
Flooring

MAIN LOCAL NAMES

Country	Local name
Brazil (Amazon)	AMAPA
Brazil (Amazon)	ARBOL VACA
Colombia	ARBOL VACA
Colombia	LECHERO
Costa Rica	PALO DE VACA
French Guiana	DOKALI
Panama	PALO DE VACA
Peru	PANGUANA
Venezuela	SANDE
United Kingdom	COW TREE

Country	Local name
Brazil (Amazon)	AMAPA DOCE
Brazil (Amazon)	LEITEIRA
Colombia	GUAIMARO
Colombia	SANDE
Ecuador	SANDE
French Guiana	TAKINA
Panama	SANDY
Venezuela	MARINA
Venezuela	VACA


Specific gravity
0,2 0,3 0,4 0,5 0,6 0,7 0,8 0,9 1 1,1 1,2
Very light Light Medium Heavy Very heavy
Monnin hardness
1 2 3 4 5 6 8 10 12 14 16 18 20
Very soft Soft Medium Hard Very hard
Coefficient of volumetric shrinkage (%)
0,3 0,4 0,5 0,6 0,7 0,8
Low Medium High
Total tangential shrinkage (%)
4 5 6 7 8 9 10 11 12
Low Medium High
Total radial shrinkage (%)
2 3 4 5 6 7 8 9 10
Low Medium High
Crushing strength (MPa)
10 20 30 40 50 60 70 80 90 100 110
Low Medium High
Static bending strength (MPa)
25 50 75 100 125 150 175 200
Low Medium High
Modulus of elasticity (x1000 MPa)
6 8 10 12 14 16 18 20 22 24 26 28 30 32
Low Medium High


Resistance to fungi
Not durable Poorly durable Moderately durable Durable Very durable
Resistance to dry wood insects borers
Susceptible Durable
Resistance to termites
Susceptible Moderately durable Durable
Treatability
Not permeable Poorly permeable Moderately permeable Easily permeable
Stability
Poorly stable Moderately stable Stable
Fibers Saturation Point
28
15 % Low 25 % Medium 35 % High 45 %