MANIL

Family: CLUSIACEAE (angiosperm)
Scientific name(s): Symphonia globulifera
Symphonia gabonensis (synonymous)
Commercial restriction: no commercial restriction
Note: This species is also found in Africa (OSSOL in Gabon).

WOOD DESCRIPTION

Color: yellow brown
Sapwood: clearly demarcated
Texture: medium
Grain: straight
Interlocked grain: absent
Note: Wood light brown to yellow brown.

LOG DESCRIPTION

Diameter: from 50 to 80 cm
Thickness of sapwood: from 4 to 8 cm
Floats: no
Log durability: low (must be treated)

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 *:	0,71	0,05
Monnin hardness *:	3,3	0,6
Coeff. of volumetric shrinkage:	0,61 %	0,06 %
Total tangential shrinkage (TS):	10,1 %	0,9 %
Total radial shrinkage (RS):	4,8 %	0,6 %
TS/RS ratio:	2,1	
Fiber saturation point:	29 %	
Stability:	poorly stable	

MECHANICAL AND ACOUSTIC PROPERTIES

	Mean	Std dev.
Crushing strength *:	58 MPa	4 MPa
Static bending strength *:	104 MPa	10 MPa
Modulus of elasticity *:	15630 MPa	1686 MPa

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

Musical quality factor: 123,5 measured at 3033 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 3 - moderately durable
Dry wood borers: durable - sapwood demarcated (risk limited to sapwood)
Termites (according to E.N. standards): class S - susceptible
Treatability (according to E.N. standards): class 3 - poorly permeable
Use class ensured by natural durability: class 2 - inside or under cover (dampness possible)
Species covering the use class 5: No
Note: Treatability seems rather easy with oily-type preservative products and difficult with saline-type preservative products.

REQUIREMENT OF A PRESERVATIVE TREATMENT

Against dry wood borer attacks: does not require any 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: high risk
Risk of casehardening: yes
Risk of checking: high risk
Risk of collapse: no
Note: Air drying under cover recommended. Moderate drying conditions and end-coating are recommended.

Possible drying schedule: 4

M.C. (%)	Temperature (°C) dry-bulb	wet-bulb	Air humidity (%)
Green	42	39	82
50	48	43	74
40	48	43	74
30	48	43	74
15	54	46	63

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

ASSEMBLING

Nailing / screwing: good but pre-boring necessary
Gluing: correct
Note: Risks of splitting when nailing.

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)

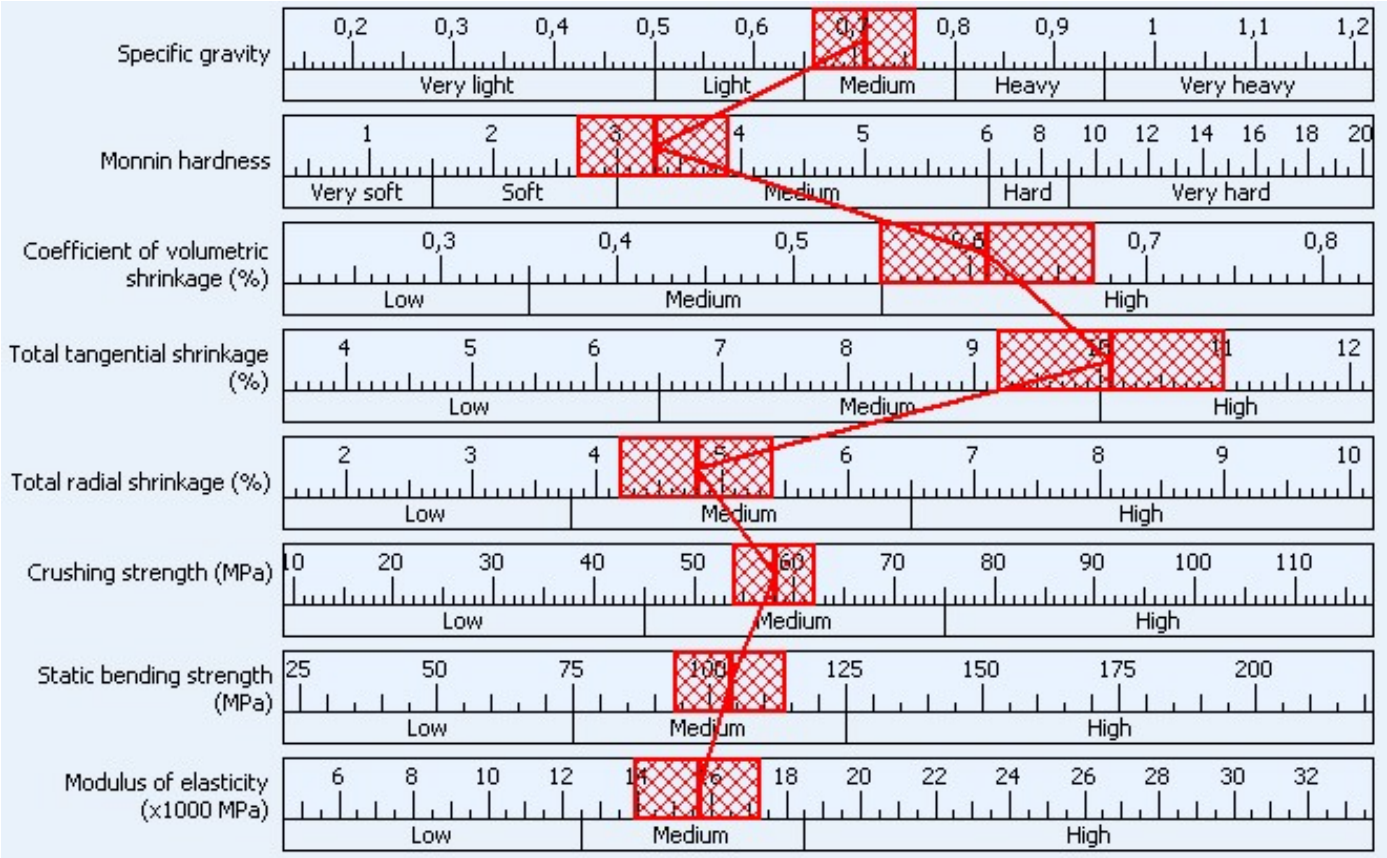
Euroclasses grading: D s2 d0
Default grading for solid wood, according to requirements of European standard EN 14081-1 annex C (April 2009). It concerns structural graded timber in vertical uses with mean density upper 0.35 and thickness upper 22 mm.

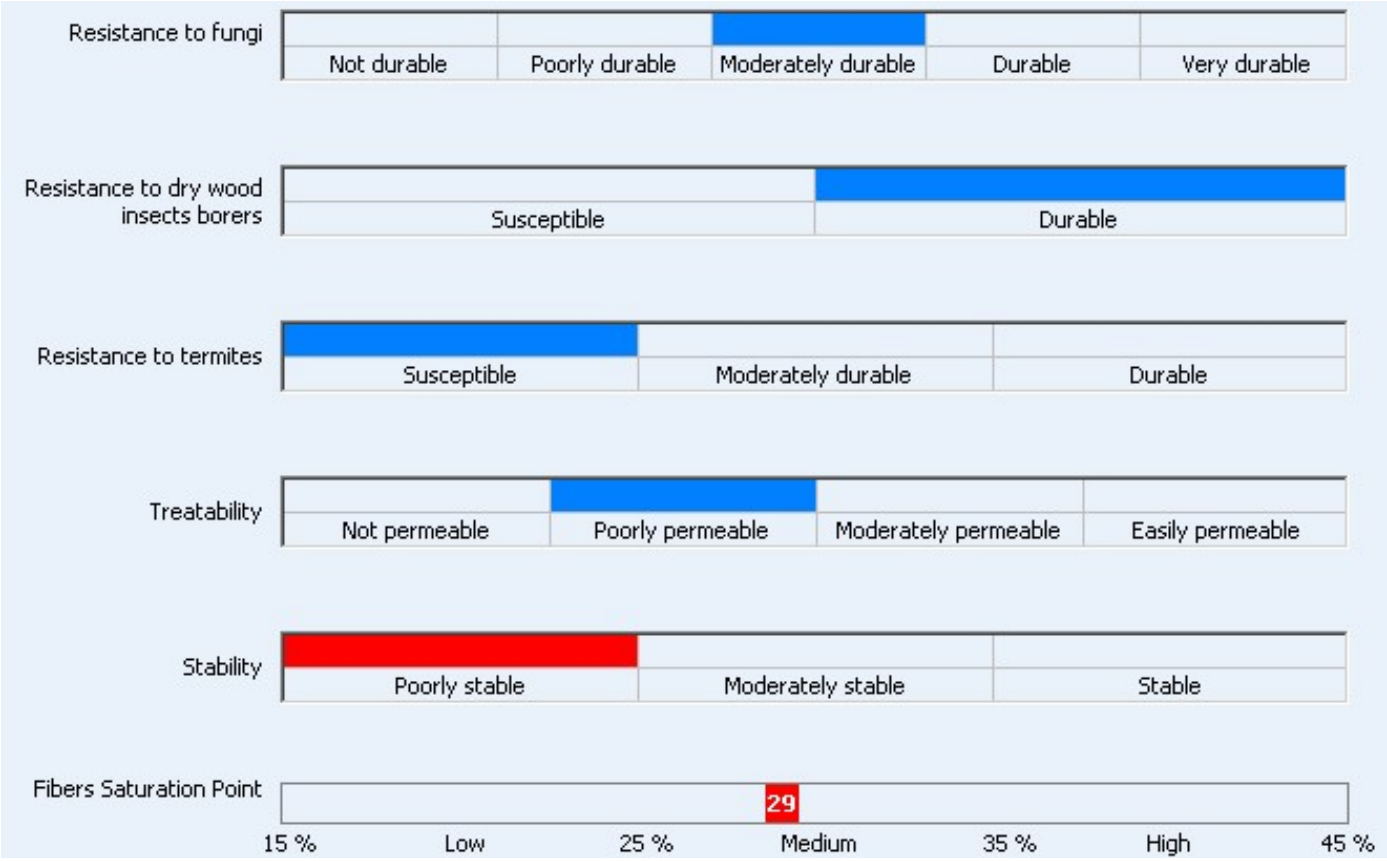
END-USES

Interior joinery
Flooring
Heavy carpentry
Cooperage
Sliced veneer
Wood-ware
Pulp
Current furniture or furniture components
Interior panelling
Boxes and crates
Veneer for back or face of plywood
Wood frame house
Moulding

MAIN LOCAL NAMES

Country	Local name	Country	Local name
Bolivia	AZUFRE	Bolivia	BREA AMARILLA
Brazil	ANANI	Brazil	CANADI
Brazil	MANI	Colombia	AZUFRE
Colombia	MACHARE	Ecuador	MACHARE
Ecuador	PUENGA	Ecuador	ZAPUTI
Guyana	MANNI	French Guiana	MANIL
French Guiana	MANIL MARECAGE	Peru	AZUFRE
Peru	BREA-CASPI	Suriname	MANI
Suriname	MATAKI	Trinidad and Tobago	MANGUE
Venezuela	MANI	Venezuela	PARAMAN
Venezuela	PERAMANCILLO	United States of America	BOARWOOD


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
29
15 % Low 25 % Medium 35 % High 45 %