# ANGELIM RAJADO



Family: FABACEAE-MIMOSOIDEAE (angiosperm)

Scientific name(s): Zygia racemosa
Marmaroxylon racemosum (synonymous)
Pithecellobium racemosum (synonymous)

Commercial restriction: no commercial restriction

## WOOD DESCRIPTION

Color: orange - yellow
Sapwood: not clearly demarcated
Texture: medium
Grain: straight or interlocked
Interlocked grain: slight

## LOG DESCRIPTION

Diameter: from 25 to 60 cm
Thickness of sapwood: from 2 to 3 cm
Floats: no
Log durability: moderate (treatment recommended)

Note: Heartwood with irregular dark brown veins.These veins are not present in sapwood. Sometimes wavy grain.

## PHYSICAL PROPERTIES

## MECHANICAL AND ACOUSTIC 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 *: | 1,03 | 0,05 |
| Monnin hardness *: | 10,6 | 2,0 |
| Coeff. of volumetric shrinkage: | 0,74 % | 0,07 % |
| Total tangential shrinkage (TS): | 10,5 % | 1,1 % |
| Total radial shrinkage (RS): | 6,0 % | 0,4 % |
| TS/RS ratio: | 1,8 | |
| Fiber saturation point: | 28 % | |

Stability: poorly stable

| | Mean | Std dev. |
|---|---|---|
| Crushing strength *: | 83 MPa | 6 MPa |
| Static bending strength *: | 150 MPa | 20 MPa |
| Modulus of elasticity *: | 27030 MPa | 1125 MPa |

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

Musical quality factor: 113 measured at 2689 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: susceptible - sapwood not or slightly demarcated (risk in all the wood)
Termites (according to E.N. standards): class D - durable
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

## 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 to slow
Risk of distortion: slight risk
Risk of casehardening: no
Risk of checking: high risk
Risk of collapse: no
Note: Drying must be done with care to reduce the risks of checks.

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: fairly high
Sawteeth recommended: stellite-tipped
Cutting tools: tungsten carbide
Peeling: not recommended or without interest
Slicing: nood
Note: Requires power. Some difficulties due to hardness and interlocked grain.

## ASSEMBLING

Nailing / screwing: good but pre-boring necessary
Gluing: correct (for interior only)
Note: Gluing must be done with 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 "BOIS SERPENT". 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)

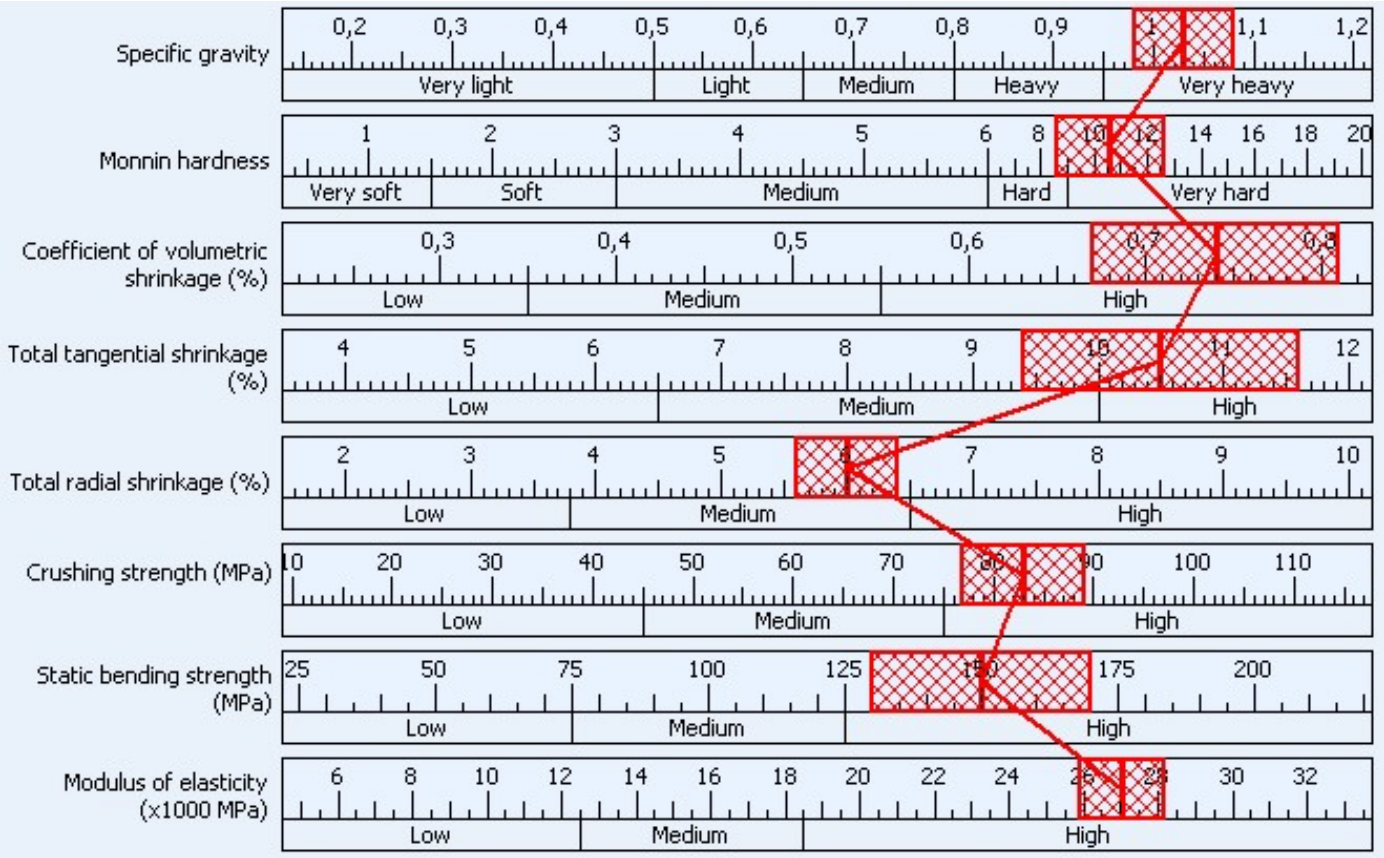
Euroclasses grading: D s2 d0
Default grading for solid wood, according to requirements of European standard EN 14081-1 annex C (April 2009). It concerns structural graded timber in vertical uses with mean density upper 0.35 and thickness upper 22 mm.

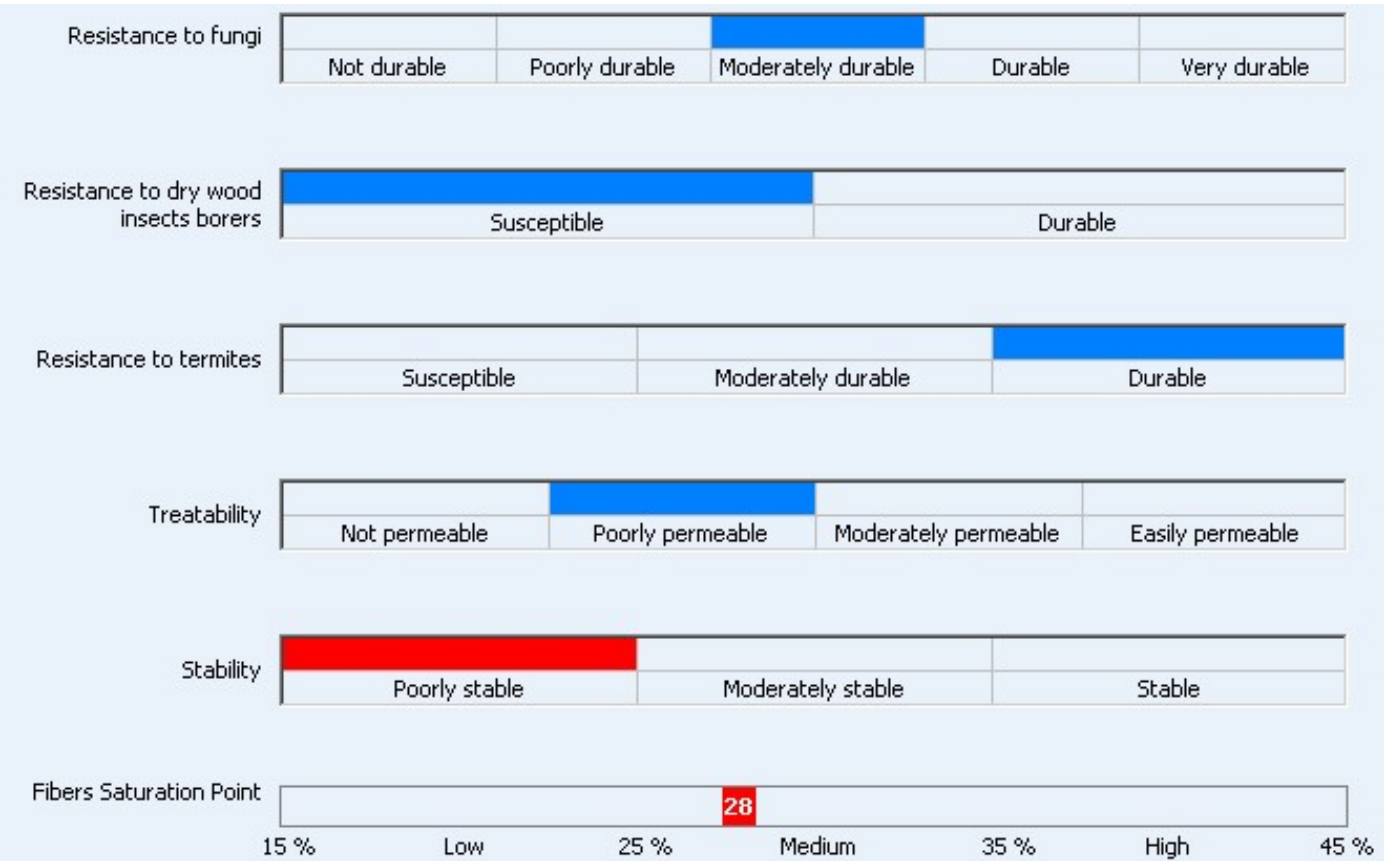
## END-USES

Current furniture or furniture components
Interior panelling
Cabinetwork (high class furniture)
Sliced veneer
Flooring
Wood-ware
Turned goods
Hydraulic works (seawater)

## MAIN LOCAL NAMES

| Country | Local name | Country | Local name |
|---|---|---|---|
| Brazil | ANGELIM RAJADO | Brazil | INGARANA |
| Brazil | INGARANA DA TERRA FIRMA | Guyana | SNAKEWOOD |
| French Guiana | BOIS SERPENT | Suriname | BOSTAMARINDE |
| Suriname | SNEKI OEDOE | | |


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 %