Family: FABACEAE-CAESALPINIOIDEAE (angiosperm)

Scientific name(s): Swartzia ingifolia
     Swartzia grandifolia
     Swartzia leiocalycina
     Swartzia panacoco

Commercial restriction: no commercial restriction

Note: CORAÇÃO DE NEGRO includes all the species with black heart belonging to the genus Swartzia in South America.

### WOOD DESCRIPTION

**Color:** dark brown

**Sapwood:** clearly demarcated

**Texture:** medium

**Grain:** straight or interlocked

**Interlocked grain:** slight

Note: Logs have a small diameter with a wide light yellow sapwood. Heartwood deep dark brown with lighter thin streaks.

### LOG DESCRIPTION

Diameter: from 40 to 60 cm

Thickness of sapwood: from 3 to 8 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.

<table>
<thead>
<tr>
<th>Property</th>
<th>Mean</th>
<th>Std dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific gravity *</td>
<td>1.20</td>
<td>0.07</td>
</tr>
<tr>
<td>Monnin hardness *</td>
<td>18.4</td>
<td>4.1</td>
</tr>
<tr>
<td>Coeff. of volumetric shrinkage</td>
<td>0.82 %</td>
<td>0.06 %</td>
</tr>
<tr>
<td>Total tangential shrinkage (TS)</td>
<td>8.3 %</td>
<td>0.6 %</td>
</tr>
<tr>
<td>Total radial shrinkage (RS)</td>
<td>6.3 %</td>
<td>1.2 %</td>
</tr>
<tr>
<td>TS/RS ratio</td>
<td>1.3</td>
<td></td>
</tr>
<tr>
<td>Fiber saturation point</td>
<td>23 %</td>
<td></td>
</tr>
</tbody>
</table>

**Stability:** moderately stable to poorly stable

### MECHANICAL AND ACOUSTIC PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Mean</th>
<th>Std dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crushing strength *</td>
<td>110 MPa</td>
<td>14 MPa</td>
</tr>
<tr>
<td>Static bending strength *</td>
<td>202 MPa</td>
<td>23 MPa</td>
</tr>
<tr>
<td>Modulus of elasticity *</td>
<td>32700 MPa</td>
<td>2673 MPa</td>
</tr>
</tbody>
</table>

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

Musical quality factor: 136.7 measured at 2799 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

- **Fungi (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:** No

Note: 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: slight risk
Risk of casehardening: no
Risk of checking: high risk
Risk of collapse: no
Note: Drying must be done slowly and carefully.

Possible drying schedule: 4

<table>
<thead>
<tr>
<th>M.C. (%)</th>
<th>Temperature (°C)</th>
<th>Air humidity (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>dry-bulb</td>
<td>wet-bulb</td>
</tr>
<tr>
<td>Green</td>
<td>42</td>
<td>39</td>
</tr>
<tr>
<td>50</td>
<td>48</td>
<td>43</td>
</tr>
<tr>
<td>40</td>
<td>48</td>
<td>43</td>
</tr>
<tr>
<td>30</td>
<td>48</td>
<td>43</td>
</tr>
<tr>
<td>15</td>
<td>54</td>
<td>46</td>
</tr>
</tbody>
</table>

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. Difficulties due to hardness.

ASSEMBLING

Nailing / screwing: good but pre-boring necessary
Gluing: poor

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

Musical instruments
Stringed instruments (bow)
Cabinetetwork (high class furniture)
Wood-ware
Sculpture
Sliced veneer
Wind instruments
Flooring
Turned goods
Current furniture or furniture components
Interior panelling
Arched goods

Note: Similar to EBONY (Diospyros spp.). End-uses are limited by the small size of logs.
### MAIN LOCAL NAMES

<table>
<thead>
<tr>
<th>Country</th>
<th>Local name</th>
<th>Country</th>
<th>Local name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil</td>
<td>CARRAPATINHO</td>
<td>Brazil</td>
<td>CORAÇAO DE NEGRO</td>
</tr>
<tr>
<td>Brazil</td>
<td>GOMBEIRA</td>
<td>Guyana</td>
<td>AGUI</td>
</tr>
<tr>
<td>Guyana</td>
<td>BANYA</td>
<td>Guyana</td>
<td>WAMARA</td>
</tr>
<tr>
<td>French Guiana</td>
<td>BOIS PERDRIX</td>
<td>French Guiana</td>
<td>FERREOL</td>
</tr>
<tr>
<td>French Guiana</td>
<td>PANACOCO</td>
<td>Suriname</td>
<td>GANDOE</td>
</tr>
<tr>
<td>Suriname</td>
<td>IJZERHART</td>
<td>Suriname</td>
<td>ZWART PARELHOUT</td>
</tr>
<tr>
<td>Germany</td>
<td>WAMARA</td>
<td>United Kingdom</td>
<td>IRONWOOD</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>WAMARA</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Specific Gravity

- Very light (0.2-0.3)
- Light (0.3-0.4)
- Medium (0.4-0.5)
- Heavy (0.5-0.6)
- Very heavy (0.6-0.7)

### Monnin Hardness

- Very soft (1)
- Soft (2)
- Medium (3-4)
- Hard (5-6)
- Very hard (7+)

### Coefficient of Volumetric Shrinkage (%)

- Low (0.3-0.4)
- Medium (0.4-0.5)
- High (0.5+)

### Total Tangential Shrinkage (%)

- Low (4-5)
- Medium (6)
- High (7+)

### Total Radial Shrinkage (%)

- Low (2-3)
- Medium (4-5)
- High (6+)

### Crushing Strength (MPa)

- Low (10-20)
- Medium (30-40)
- High (50+)

### Static Bending Strength (MPa)

- Low (25-50)
- Medium (75-100)
- High (125+)

### Modulus of Elasticity (<1000 MPa)

- Low (6-8)
- Medium (10-12)
- High (14+)

### 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

- Low (15%)
- Medium (25%)
- High (45%)