Family: MELIACEAE (angiosperm)
Scientific name(s): Entandrophragma angolense
Entandrophragma congoense
Entandrophragma excelsum
Commercial restriction: no commercial restriction

WOOD DESCRIPTION

<table>
<thead>
<tr>
<th>Color:</th>
<th>red brown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sapwood:</td>
<td>clearly demarcated</td>
</tr>
<tr>
<td>Texture:</td>
<td>medium</td>
</tr>
<tr>
<td>Grain:</td>
<td>interlocked</td>
</tr>
<tr>
<td>Interlocked grain:</td>
<td>marked</td>
</tr>
</tbody>
</table>

Note: Wood red to dark brown, with golden shades.

LOG DESCRIPTION

<table>
<thead>
<tr>
<th>Diameter: from 80 to 120 cm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thickness of sapwood: from 6 to 10 cm</td>
</tr>
<tr>
<td>Floats: yes</td>
</tr>
</tbody>
</table>

Log durability: moderate (treatment recommended)

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>Mean</th>
<th>Std dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific gravity *: 0.55</td>
<td>0.05</td>
</tr>
<tr>
<td>Monnin hardness *: 2.2</td>
<td>0.5</td>
</tr>
<tr>
<td>Coeff. of volumetric shrinkage: 0.41 %</td>
<td>0.07 %</td>
</tr>
<tr>
<td>Total tangential shrinkage (TS): 8.0 %</td>
<td>1.0 %</td>
</tr>
<tr>
<td>Total radial shrinkage (RS): 4.6 %</td>
<td>1.0 %</td>
</tr>
<tr>
<td>TS/RS ratio: 1.7</td>
<td></td>
</tr>
<tr>
<td>Fiber saturation point: 32 %</td>
<td></td>
</tr>
</tbody>
</table>

Stability: moderately stable to stable

MECHANICAL AND ACOUSTIC PROPERTIES

<table>
<thead>
<tr>
<th>Mean</th>
<th>Std dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crushing strength *: 47 MPa</td>
<td>6 MPa</td>
</tr>
<tr>
<td>Static bending strength *: 80 MPa</td>
<td>12 MPa</td>
</tr>
<tr>
<td>Modulus of elasticity *: 10980 MPa</td>
<td>1148 MPa</td>
</tr>
</tbody>
</table>

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

Musical quality factor: 93.7 measured at 2865 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 5 - susceptible

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

Use class ensured by natural durability: class 2 - inside or under cover (dampness possible)

Species covering the use class 5: No

Note: This species is listed in the European standard NF EN 350-2.

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: no
- Risk of checking: high risk
- Risk of collapse: no

Note: Drying requires care in presence of highly interlocked grain in order to avoid distortions.

Possible drying schedule: 1

<table>
<thead>
<tr>
<th>M.C. (%)</th>
<th>Temperature (°C)</th>
<th>Air humidity (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green</td>
<td>dry-bulb</td>
<td>wet-bulb</td>
</tr>
<tr>
<td>40</td>
<td>40</td>
<td>37</td>
</tr>
<tr>
<td>30</td>
<td>44</td>
<td>36</td>
</tr>
<tr>
<td>20</td>
<td>46</td>
<td>36</td>
</tr>
<tr>
<td>15</td>
<td>49</td>
<td>37</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: normal
- Sawteeth recommended: ordinary or alloy steel
- Cutting tools: ordinary
  - Peeling: good
  - Slicing: nood

Note: In planing, if the grain is highly interlocked, a 15° cutting angle is necessary to avoid tearing. Tends to burn in mortising.

ASSEMBLING

- Nailing / screwing: good
- Gluing: correct

COMMERCIAL GRADING

Appearance grading for sawn timbers: According to SATA grading rules (1996)

For the "General Purpose Market":
- Possible grading for square edged timbers: choix I, choix II, choix III, choix IV
- Possible grading for short length lumbers: choix I, choix II
- Possible grading for short length rafters: choix I, choix II, choix III

For the "Special Market":
- Possible grading for strips and small boards (ou battens): choix I, choix II, choix III
- Possible grading for rafters: choix I, choix II, choix III

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.

FIRE SAFETY

Conventional French grading:

- Thickness > 14 mm: M.3 (moderately inflammable)
- Thickness < 14 mm: M.4 (easily inflammable)

END-USES

- Sliced veneer
- Veneer for back or face of plywood
- Interior joinery
- Exterior panelling
- Stairs (inside)
- Ship building (planking and deck)
- Cabinet (high class furniture)
- Exterior joinery
- Interior panelling
- Flooring
- Current furniture or furniture components
- Light carpentry
## 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>Angola</td>
<td>ACUMINATA</td>
<td>Angola</td>
<td>LIVUITE</td>
</tr>
<tr>
<td>Cameroon</td>
<td>ABEBA</td>
<td>Congo</td>
<td>KILULA</td>
</tr>
<tr>
<td>Ivory Coast</td>
<td>TIAMA</td>
<td>Gabon</td>
<td>ABEUBEGNE</td>
</tr>
<tr>
<td>Ghana</td>
<td>EDINAM</td>
<td>Equatorial Guinea</td>
<td>DONGOMANGUI/LA</td>
</tr>
<tr>
<td>Nigeria</td>
<td>GEDU NOHOR</td>
<td>Uganda</td>
<td>MUKUSU</td>
</tr>
<tr>
<td>Central African Republic</td>
<td>KANGA</td>
<td>Democratic Republic of the Congo</td>
<td>LIFAKI</td>
</tr>
<tr>
<td>Democratic Republic of the Congo</td>
<td>VOOO</td>
<td>Germany</td>
<td>ACUMINATA</td>
</tr>
<tr>
<td>Germany</td>
<td>TIAMA MAHOGANI</td>
<td>United Kingdom</td>
<td>GEDU NOHOR</td>
</tr>
</tbody>
</table>
### Specific Gravity

- 0.2: Very light
- 0.3: Light
- 0.4: Medium
- 0.5: Heavy
- 0.6: Very heavy

### Monnin Hardness

- 1: Very soft
- 2: Soft
- 3: Medium
- 4: Hard
- 5: Very hard

### Coefficient of Volumetric Shrinkage (%)

- 0.3: Low
- 0.5: Medium
- 0.6: High

### Total Tangential Shrinkage (%)

- 4: Low
- 5: Medium
- 6: High

### Total Radial Shrinkage (%)

- 2: Low
- 3: Medium
- 4: High

### Crushing Strength (MPa)

- 10: Low
- 20: Medium
- 30: High

### Static Bending Strength (MPa)

- 25: Low
- 50: Medium
- 75: High

### Modulus of Elasticity (≤1000 MPa)

- 6: Low
- 8: Medium
- 10: High

### Resistance to Fungi

- Not durable
- Poorly durable
- Moderately durable
- Durable
- Very durable

### Resistance to Dry Wood Insects Borer

- 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: 32%
- High: 45%