HEVEA

Family: EUPHORBIACEAE (angiosperm)
Scientific name(s): Hevea spp.
Commercial restriction: no commercial restriction

Note: Native from the Amazonian forest, HEVEA was widely planted in South East Asia and later in Africa. RUBBER WOOD is the name used in all South East Asia.

WOOD DESCRIPTION

Color: creamy white
Sapwood: not demarcated
Texture: coarse
Grain: straight or interlocked
Interlocked grain: slight

LOG DESCRIPTION

Diameter: from 30 to 60 cm
Thickness of sapwood:
Floats: yes
Log durability: low (must be treated)

Note: Logs must be treated, extracted and sawn as soon as possible after felling. Cream white wood becoming light brown.

PHYSICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Mean</th>
<th>Std dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific gravity *</td>
<td>0.65</td>
<td>0.06</td>
</tr>
<tr>
<td>Monnin hardness *</td>
<td>3.0</td>
<td>0.6</td>
</tr>
<tr>
<td>Coeff. of volumetric shrinkage</td>
<td>0.41 %</td>
<td>0.05 %</td>
</tr>
<tr>
<td>Total tangential shrinkage (TS)</td>
<td>5.6 %</td>
<td>0.8 %</td>
</tr>
<tr>
<td>Total radial shrinkage (RS)</td>
<td>2.2 %</td>
<td>0.2 %</td>
</tr>
<tr>
<td>TS/RS ratio</td>
<td>2.5</td>
<td></td>
</tr>
<tr>
<td>Fiber saturation point</td>
<td>24 %</td>
<td></td>
</tr>
</tbody>
</table>

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>51 MPa</td>
<td>7 MPa</td>
</tr>
<tr>
<td>Static bending strength *</td>
<td>82 MPa</td>
<td>12 MPa</td>
</tr>
<tr>
<td>Modulus of elasticity *</td>
<td>11760 MPa</td>
<td>1803 MPa</td>
</tr>
<tr>
<td>(*: at 12% moisture content, with 1 MPa = 1 N/mm²)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Musical quality factor</td>
<td>107.6 measured at 2394 Hz</td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Fungi (according to E.N. standards):</th>
<th>class 5 - not durable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry wood borers: susceptible - sapwood not or slightly demarcated (risk in all the wood)</td>
<td></td>
</tr>
<tr>
<td>Termites (according to E.N. standards):</td>
<td>class 5 - susceptible</td>
</tr>
<tr>
<td>Treatability (according to E.N. standards):</td>
<td>class 1 - easily permeable</td>
</tr>
<tr>
<td>Use class ensured by natural durability:</td>
<td>class 1 - inside (no dampness)</td>
</tr>
<tr>
<td>Species covering the use class 5:</td>
<td>No</td>
</tr>
<tr>
<td>Note: Prone to blue stain.</td>
<td></td>
</tr>
</tbody>
</table>

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: rapid
Risk of distortion: high risk
Risk of casehardening: no
Risk of checking: high risk
Risk of collapse: no

Note: Careful piling, top weighting of the stacks and end-coating are recommended to avoid distortions and cracks.

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: normal
Sawteeth recommended: ordinary or alloy steel
Cutting tools: ordinary
Peeling: good
Slicing: nod

Note: Presence of internal stresses. Sharp edges are recommended to avoid a fuzzy surface. Latex tends to clog sawteeth.

ASSEMBLING

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

Note: Tends to split when nailing.

COMMERCIAL GRADING

Appearance grading for sawn timbers: Grading depending on the source

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
Flooring
Pulp
Boxes and crates
Veneer for interior of plywood
Light carpentry

Interior joinery
Moulding
Sliced veneer
Stairs (inside)
Fiber or particle boards
Blockboard
Glued laminated

Note: Stains well.
## 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>HEVEA</td>
<td>Brazil</td>
<td>MAPALAPA</td>
</tr>
<tr>
<td>Brazil</td>
<td>SERINGA</td>
<td>Brazil</td>
<td>SERINGUEIRA</td>
</tr>
<tr>
<td>Guyana</td>
<td>HATTI</td>
<td>Malaysia (islands)</td>
<td>HEVEA WOOD</td>
</tr>
<tr>
<td>Peru</td>
<td>JEVE</td>
<td>Peru</td>
<td>SHIRENGA</td>
</tr>
<tr>
<td>Thailand</td>
<td>RUBBER TREE</td>
<td>Venezuela</td>
<td>ARBOL DE CAUCHO</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>PARA RUBBER TREE</td>
<td>United States of America</td>
<td>RUBBER WOOD</td>
</tr>
</tbody>
</table>
### 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 0.5 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 (%)

- 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 50 100 125 150 175 200
- **Low** Medium High

### Modulus of Elasticity (≤1000 MPa)

- 6 8 10 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 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

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