



# Bangkirai

## Atibt

Yellow balau/bankirai/selangan-batu

## Other names

Bangkirai, benuas, damar laut, simantuk, poöti (Indonesië), Bangkirai (Netherlands), yellow balau (Peninsular Malaysia), selangan batu, selangan batu kumus, balau kumus, tekam (Noord-Borneo, Sarawak), gisok, malayakal, yakal, (Filipijnen), aek, lastao, chan (Thailand), song-da (Vietnam).



## Botanic name

*Shorea atrivernosa* SYM., *S. foxworthyi* SYM., *S. gisok* FOXW., *S. glauca* KING, *S. laevis* RIDL. (= *S. laevifolia* (PARIJS) ENDERT), *S. maxwelliana* (V. SL. ex FOXW.) SYM., *S. spec. div.* Sectie: *Shorea*, *Neohopea* (Ashton 1983).

## Family

Dipterocarpaceae.

## Growth area

Southeast Asia. Supplied mainly from the Malaysian states of Sabah and Sarawak.

### Tree Description

The trees in this group of *Shorea* species are 35-40 m high, up to 60 m, depending on species and growing site. Older trees often have 1-3 m high root strips. The branch-free trunks are generally straight, round and up to 20-25 m long and have a diameter of 0.6-0.8 m, maximum 2 m.

### Supply

Edged wood.

### Wood Description

Fresh, the heartwood of balau is yellow to gray-brown in color, sometimes with a reddish tinge. In daylight, it initially discolors rapidly to brown and then only slowly to dark brown. The white to light brown colored sapwood, clearly contrasts with the heartwood and is 20-70 mm wide. Balau has a fine and uniform texture and usually a strong crossgrain that creates a distinct stripe pattern on the radial or quarter plane. Axial resin corridors are common in the wood in tangential bands and form whitish streaks on the longitudinal surface of the wood. Apart from occasional pinholes (small wormholes), small resin pockets and a few surface cracks, the wood is virtually flawless.

### Grain

Strong cross thread, but straight and wavy thread also occurs.

### Texture

Fine to moderately coarse.

### Voluminous mass

930 (700-1150) kg/m<sup>3</sup> at 12% moisture content.

### Work

Medium to large, depending on the species.

### Shrinkage

Very slow. Although the shrinkage is stated as moderate, the wood has a marked tendency to surface cracking and end cracks especially when exposed to the sun and if dried too quickly. It should be dried very slowly and carefully.



### **Machinability**

Despite its great hardness, balau cuts, saws and planes quite well. Due to the cross grain, many indentations can occur when planing quarter-sawn surfaces. A well-chosen chip angle can improve this.

### **Nailing & Screwing**

Pre-drilling required.

### **Adhesives**

Poor. A study by TNO-Building Center for Wood Technology on the adhesiveness of balau with PVAC adhesives with hardeners based on chromium salts and aluminum salts and with an adhesive based on resorcinol-formaldehyde with hardener, did not result in good bonds.

### **Bend**

Presumably moderate.

### **Surface finish**

Poor. Finishing with clear varnish, stain paint or alkyd resin paint can cause problems. With a clear finish, the faster discoloration must be considered. In addition, very fine cracks in the wood surface can cause the finish layer above the crack to crack fairly quickly when exposed to weather and wind, after which flaking will soon follow. By the way, the adhesion of said products is good. In general, however, this type of wood is used for applications where there is no finish.

### **Impregnability**

Heartwood 4. Sapwood 1-2.

### **Applications**

Balau with its good mechanical properties and durability is a distinct wood species for outdoor applications, in heavy structures, bridges, bridge decks and bridge railings, noise barriers, locks and other water works in fresh water such as sheet piling, jetties, etc. Also suitable for industrial and wagon floors, posts, sleepers, barrels, fences, gates, pergolas and park benches.

### **Details**

A number of species in this group contain water-soluble gum. The gum dissolved in water can cause brown stains (bleeding) on underlying work. However, these stains usually disappear after a few months. The stains are largely preventable by thoroughly rinsing/brushing the processed parts with water before application. Parts exposed to sun and wind may rebleed after dry periods, even after years, due to gum leaching from newly created cracks.

## **Sustainability**

### **Relative resistance to mold**

I-II (for wood with a density greater than 850 kg/m<sup>3</sup> at 12% moisture content).

### **Relative resistance to animal organisms**

Balau/bangkirai/selangan batu is also highly resistant to attack by acids and other chemicals. Quality requirements selangan batu meets the requirements listed in Assessment Guideline (BRL) 2351/01, Dung basins of wood.