CocoVeneer products

Characteristics of coconut veneer and veneer products.

Thanks to Rob McGavin and the QDAF team for veneer, product assembly and testing results.
• Material characteristics of coconut veneer.
  – Density and strength
• Product assembly: architectural and structural.
• Potential market advantages and constraints.
The wood consists of high density vascular bundles in a matrix of spongy, low-density, parenchyma tissue. Low radial and tangential connection between bundles. Bundles clustered at the outside of the stem.
Veneer characteristics: density

Distribution of veneer air-dry density

Example of density radial variation from the centre to the outside of a coconut log
Veneer characteristics: stiffness

Veneer MOE
Average MOE is relatively low compared to most commercial wood species.

The correlation of MOE to density.

Advanced veneer and other product from coconut wood
Impact of temperature and adhesion

Advanced veneer and other product from coconut wood
Properties summary

- Tests confirmed the wide range of density and modulus of elasticity values expected in coconut veneer.
  - The density range is potentially two to three times more than expected in most commercial wood species.
- The veneer MOE results were generally low compared to most commercial wood species.
The range for veneer-based products includes:

- **Structural products:**
  - plywood and laminated veneer lumber (LVL).

- **Architectural products:**
  - appearance veneer on board, engineered flooring, multilaminar products.

Test products of each types were assembled and are being tested.

Source veneer was sorted into density groups.

- Low density (<400 kg/m$^3$)
- Medium density (400-600 kg/m$^3$)
- Medium-high density (600-800 kg/m$^3$)
- High density (>800kg/m$^3$).
Products: plywood

Plywood: Overlay & structural

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Products: LVL

Laminated veneer lumber (LVL)

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Products: overlay

Veneer overlay on board

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Products: Engineered flooring

Engineered flooring overlay

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Products: multilaminar

Multilaminar blocks for resawing

Advanced veneer and other product from coconut wood
Products: multilaminar

*Sawn multilaminar section: edge grain.*
Products: multilaminar

Sawn multilaminar section: end grain

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Products: multilaminar

Sawn and turned multilaminar section

Advanced veneer and other product from coconut wood
Further product assembly
Further product testing: plywood
Further product testing: LVL
Product summary

• A range of appearance and structural product opportunities exist for coconut veneer.
  – The project has not yet fully explored the range of possible product opportunities.

• Coconut veneer has some unique qualities that enable potentially high value niche markets to be pursued.
  – Attractive colour, even toned surface, high density, sustainability.
Product summary

• All veneer groups produced could be used with a sensible target product mix and intelligent construction strategies.
  – Several common structural adhesive systems are effective for bonding coconut veneer.

• Various products can be manufactured using:
  – only coconut veneer, or
  – coconut veneer in combined with other traditional wood feed stocks.

• These include:
  – Structural and appearance plywood, LVL, engineered flooring, wall paneling, and multi-laminar beams and panels.
Questions