

Native Forest Logging: Sustainable substitute products

3RT Designer Hardwood

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About the Australian Rainforest Conservation Society Inc.

The Australian Rainforest Conservation Society (ARCS) is one of Australia's premier nature conservation organisations with a history of delivering science-based conservation outcomes for biodiversity, Australia's forests and our unique World Heritage.

ARCS founders Drs Aila Keto and Keith Scott were commissioned by Federal Governments to write three of Australia's successful **World Heritage** nominations - the Wet Tropics, Gari (Fraser Island), and the Gondwanan Rainforests of Australia. Dr Keto, was a formative member of the Wet Tropics World Heritage Management Board and currently contributes to management of the Gondwana Rainforests of Australia World Heritage Area through its Technical and Scientific Advisory Committees since 2007.

Our expertise includes **rainforest restoration** in areas needed to protect the core values of the Gondwanan Rainforests World Heritage Area. Our ecological restoration work on the Springbrook Plateau (Springbrook Rescue) has been showcased by IUCN as one of 12 global case studies (Keenleyside *et al.* 2012).

ARCS core focus over the past 40 years has been on the unsustainability of **native forest logging**, the availability of sustainable substitute resources and products, and, significantly increasing the protected area estate. ARCS was a partner in the international **Primary Forest & Climate Change Project** led by Professor Brendan Mackey who heads the Griffith University's *Griffith Climate Action Beacon*. Through outcomes of its research program the project contributes significantly to international policy improvements for primary forests. Our involvement ensures ARCS is up to date on the latest research on the linked biodiversity and climate existential challenges facing life on Earth and their solutions. A key message is that neither existential crisis can be effectively addressed unless we protect and restore ecosystem integrity to ensure their stability and resilience.

Fundamentally, ARCS recognises and adopts systems thinking for achieving necessary transformational systems change.

This ARCS Briefing Paper Series is published electronically at <https://savegreatergliders.org.au/woodsupply.html>

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1. SUMMARY

Peter Torreele in association with Flinders University (SA) co-founded 3RT in 2014. In collaboration with global tech giants *Henkel Adhesive Technologies* and *Bosch Manufacturing Solutions* this transformative timber technology produces a wide range of engineered hardwood products from 5-year old plantations indistinguishable from those derived from old growth native forests.

2. The products

Peter Torreele, co-founder of 3RT in 2014, claims you can create tailored substitutes for native hardwood products from all kinds of waste wood inputs with the right recipe but they are currently focusing on veneers for Designer Hardwood because these look indistinguishable from traditional hardwoods.

Product characteristics:

1. Fully recyclable, toxin-free engineered timber products in client-selected colours, texture and appearance for a wide range of applications including furniture, flooring, stairs, external cladding, interior wall panelling and more.
2. Effectively engineered wood products to replace those from ‘old growth native forests
3. Converts low-value wood fibre from plantations into high-value hardwood products indistinguishable in appearance, properties and function from those produced from 100-year old native forests.
4. Involves a patented process, using water-based, formaldehyde-free “Nano-glue” that “biomimics” nature (lignin) to bind plantation residues into a product indistinguishable from hardwood coming from old growth native forests.
5. Involves advanced robotics and smart automation (effectively a large scale version of 3-D printing)

3. 3RT History

1. 3RT was established in 2014 by current Managing Director Peter Torreele. Torreele was so shocked by the level of waste associated with traditional native hardwood sawmilling which inspired him to investigate the potential of advanced automation to protect native forests worldwide.
2. Projected market size of AUD1.2bn globally
3. Contact: 1300 152 144
4. Email: info@3RT.com.au

4. 3RT Collaborators

4.1 Henkel Adhesive Technologies through subsidiary Henkel Tech Ventures – a German chemical industry giant invested in 3RT.

- a) A Global leader in adhesives market
- b) Annual Operating profit ~ 2.7 bn euros (2021) = AUD4.6 billion (July 2023)
- c) Employment — more than 52,000 globally
- d) A leading provider of engineered wood solutions
- e) especially high-impact *structural adhesives* (e.g. Loctite brand):
 - facilitating manufacture of alternative mass timber products to replace
 - i. those from native forests; including:
 - ii. concrete and steel;
 - i. with more sustainable, renewable, and low carbon-emissive products
- f) the high-tech adhesives of Henkel are crucial for production of sustainable engineered wood products with a low carbon footprint

4.2. Bosch Manufacturing Solutions

- a) Has huge global market share: total sales worth 78.8bn Euros in 2021 (AUD123bn)
- b) More than 2050 plants worldwide
- c) Unique manufacturing know-how — Manufactures, installs and maintains the digital production units around the world
- d) Providing 3RT with capacity to rapidly upscale and globalise the product in the future.

4.3. Flinders University

- 3RT began working with Flinders University (SA) shortly after forming in 2014, initially setting up in the Tonsley Innovation Hub, then more recently in a larger space at Adelaide Airport.

- Researchers from the Flinders Institute for NanoScale Science & Technology . The Centre is geared up to service all new customers providing requisite software for new customer specified products.
- Professor David Lewis (Flinders University) also a director of 3RT
- Flinders University owns shares in 3RT as part of their research contract.

5. Product Applications

- walls and floors (Fig 4, Figure 5)
- doors, decorative panelling, DAR (Dressed All Round) components
- stair treads & balustrades (Figure 3, Figure 6)
- benchtops (Figure 2)
- furniture: benches, dining tables (Figure 4), boardroom tables, reception desks
- craft and mouldings

6. Cost effectiveness

- No comparative costs are available yet but we were assured products are cost competitive.
- A company spokesperson indicated the process for converting chips/sawdust is not cost competitive yet. Supporting development funding from government is an avenue worth pursuing. The original work was facilitated by a grant from the Federal Government.

7. Employment potential

- low employment potential of 3RT products due to the high level of mechanisation & automation
- alternative employment opportunities should be available in restoration of logged forests, and associated with the climate-biodiversity transition

Note: 100,000 tonnes of mill waste from softwood plantations on the Sunshine Coast (early thinings) at one site are currently converted to 'pellets' and exported to Japan and Europe for use as biofuels (a carbon-intensive, non-renewable fuel).

Thus 3RT products enable a transition from low-value, high carbon emissive pellet manufacturing from plantation thinnings to high value-added, longer lasting, recyclable designer wood.

Effectively the 3RT process facilitates high-quality hardwood products (mimicking those from 100-year-old old growth native forests) from as early as 5 years of plantation growth even from softwood plantations (if the economics permits).

We have discussed the technology with staff of Senator Murray Watt (Federal Hon. Minister for Agriculture, Fisheries and Forestry) who have been impressed with what they've seen when they visited 3RT facilities. They indicated that money would be available in the last budget (2023). None appears to have been forthcoming.

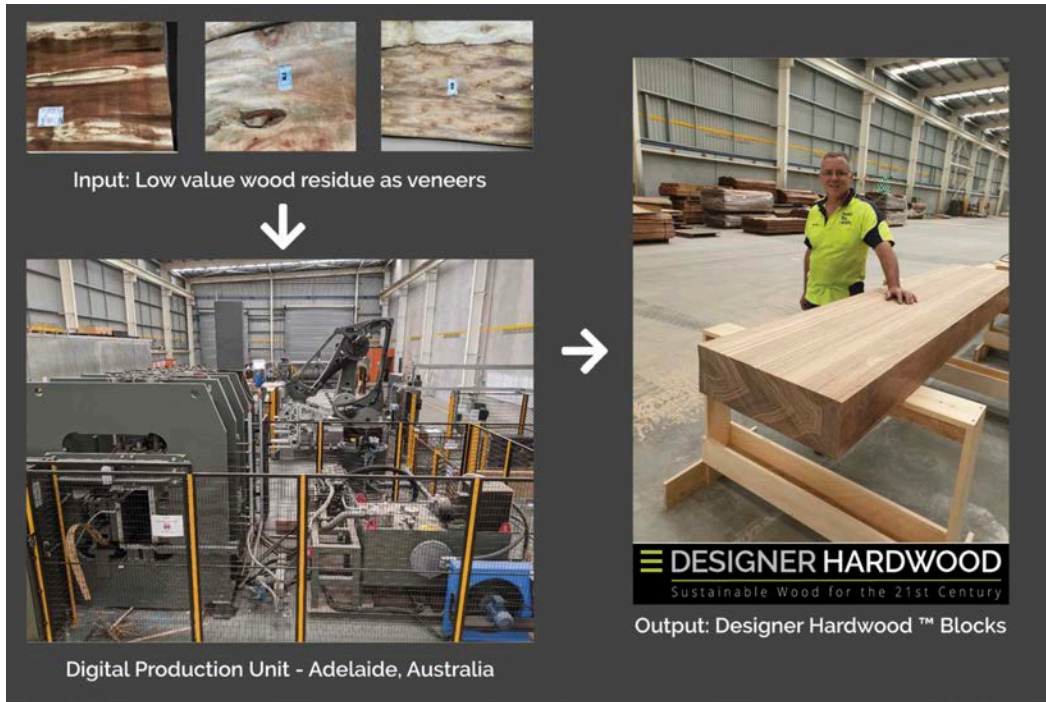


Figure 1. The three images depict, input residues, the processing plant and an example of large-beam products. These can be up to 6 metres long.



Figure 2. An example of flooring and benches by Designer Hardwood from 3RT



Figure 3. An example of a staircase produced by Designer Hardwood from 3RT



Figure 4. A 3RT example of a solid tabletop and parquetry flooring produced by Designer Hardwood



Figure 5. A 3RT example of large, long-length decorative ceiling beams (Designer Hardwood)



Figure 6. A 3RT example of staircase and large-dimension, solid floor-ceiling decorative beams (Designer Hardwood)