ThermoWood®

Australasia's first heat treatment operation for Radiata pine

Daan Olthuis
Managing Director

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Tunnicliffe's

Tunnicliffe Timber Company Limited

Content of Presentation

- Purpose
- Tunnicliffe Timber Company Limited
- Wood Modification Technology
- ThermoWood®
- ThermoWood®230 Product Examples

Purpose of Presentation

- Sharing our experience
- We are no promoters, researchers or scientists

Tunnicliffe Timber Company Limited

- Long established small business Eastern Bay of Plenty, New Zealand since 1929
- Currently employing 17 permanent staff
- Re-manufacturing of RS Kiln Dried Radiata pine
- Finger-jointing core business
- We process on average 300m3 of timber per month
- Niche Markets

- Timber Joiners
- Door Manufacturers
- Door Pre-hangers
- Aluminium Joiners
- Beekeepers
- Custom Processing

Wood Modification Technology

Permanent change of wood properties

- Acetylation (Chemical)
- Furfurylation (Chemical)
- Thermal Modification (TMT)
- Others (Wood hardening)

TMT History

- Vikings (700 – 1050 ad)
- Initial Scientific Studies USA – Germany 1930's – 40's
- Advanced studies in Germany during 1950's
- Commercialisation in 1990's
  - Finland
  - France
  - Netherlands

Structure of TMT Industry

TOTAL PRODUCTION OF TMT WORLDWIDE

OTHER TECHNOLOGIES **15** PROVIDERS AND SOME SELFMADE	**THERMOWOOD TECHNOLOGY** **2 (3)** PROVIDERS AND SOME SELFMADE	
Appr **55** chambers	Appr **55** chambers	
TMT based to several technologies	TMT based to TW technology	**THERMOWOOD®** ITWA MEMBERS
120 000 – 140 000 m^3 2011	**70 000 – 80 000 m^3 2011**	**110 000 m^3 2011**

Production statistics are availabe from ITWA only, other figures are estimates, based on interviews and information available from public sources compilated by Timo Tetri Jartek Oy

TMT Markets

- Europe and North America
- Replacement of
  - Tropical Timbers
  - Naturally Durable Timbers
  - Softwood treated with chemical preservatives
- TMT producers use local species
  - Main species: Spruce and Pine
  - Some hardwood flooring and furniture (colouring)
  - European market imports raw material other regions
- Main products
  - Cladding and Decking
- Focus on Environment

Main Products

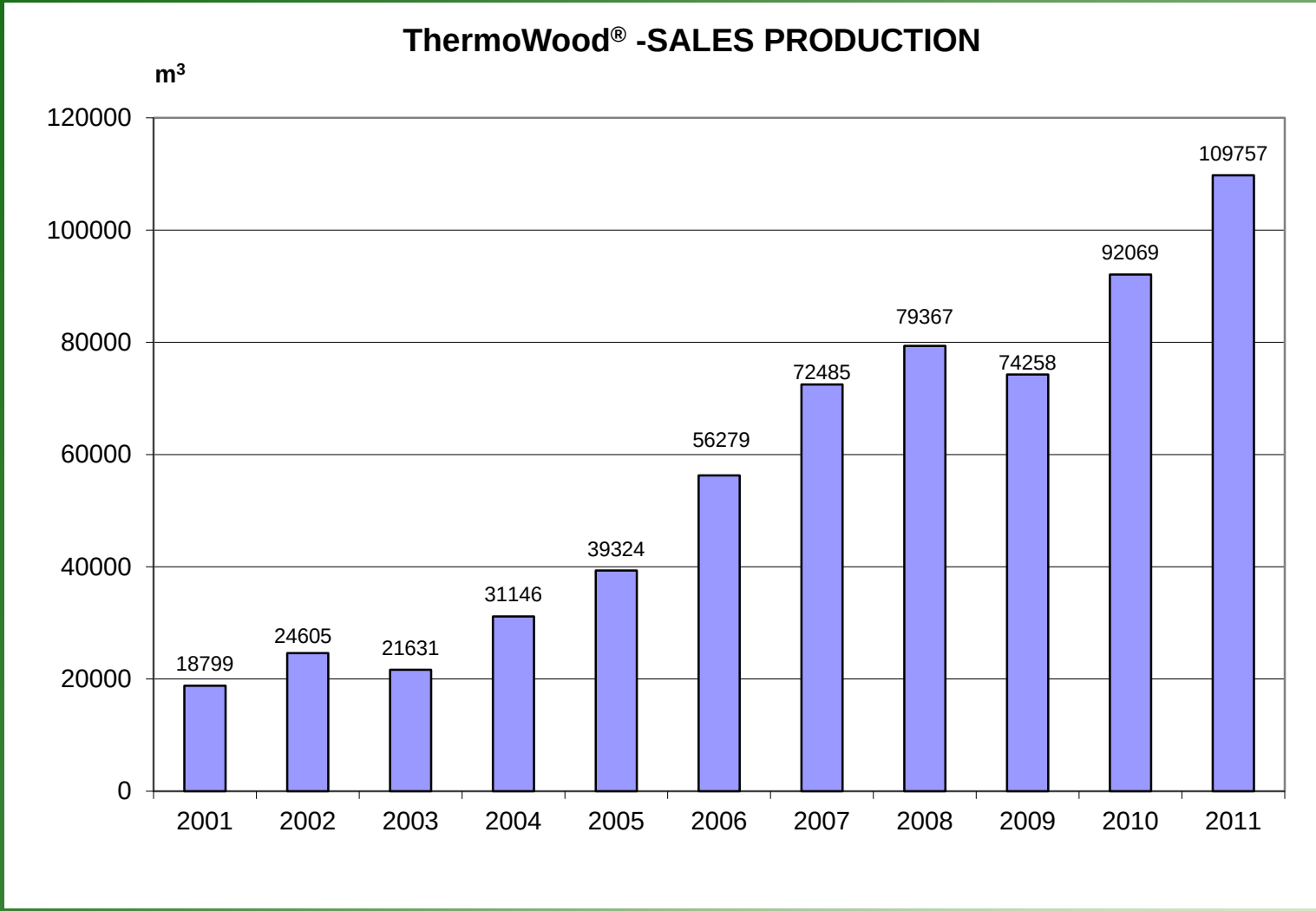
Cladding

Decking

ThermoWood®

- Originated Finland
- International ThermoWood Association
- Approx. 300,000 m3 TMT 2011
- Approx. 65% ThermoWood® technology

Thermowood® Production Update

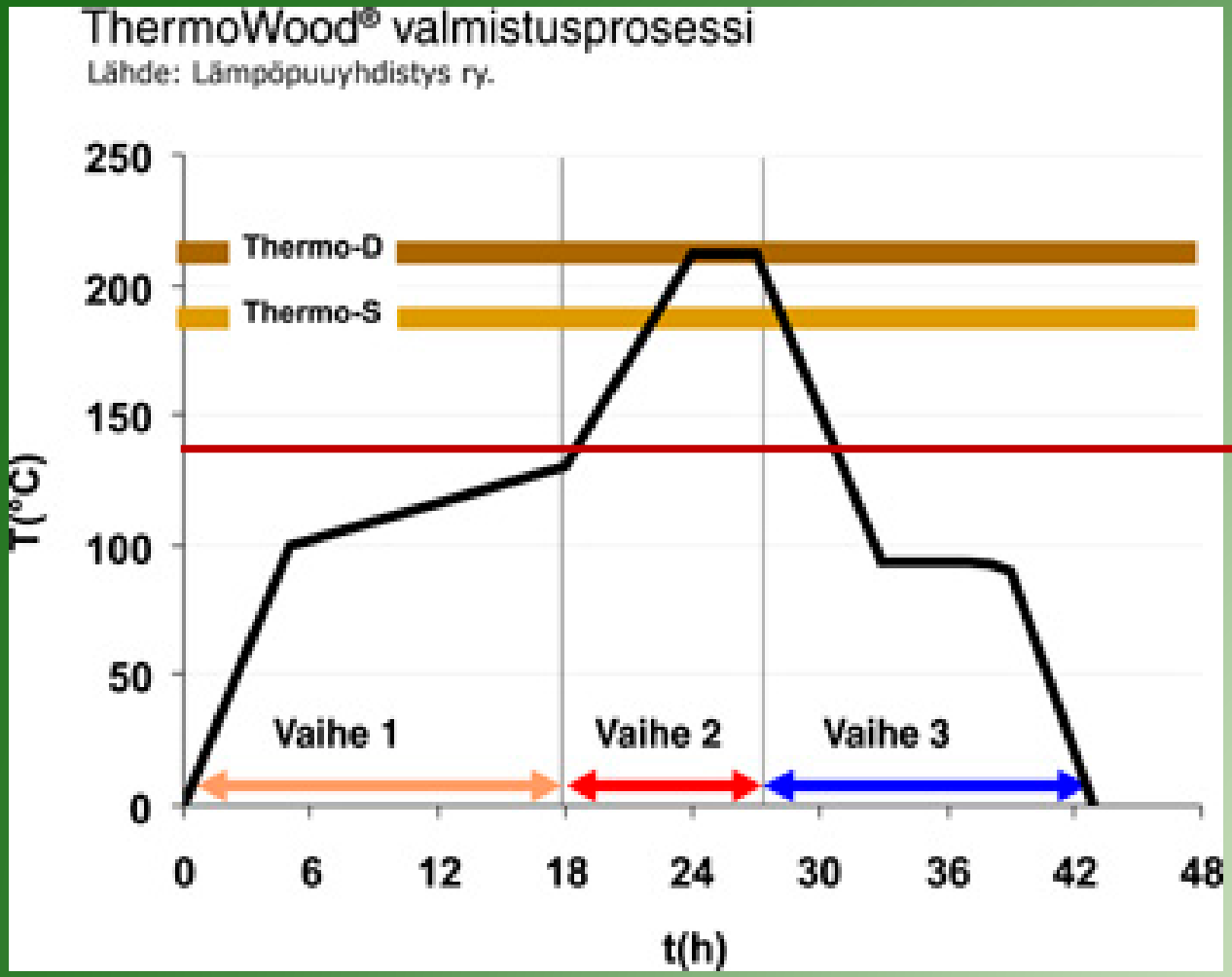


ThermoWood® Process

- Thermal degrading of hemicellulose
- Purposely built kiln (230 degrees C)
- From Green or Kiln Dried
  - 25mm 18 to 22 hours (1 day)
  - 50mm 32 to 38 hours (2 days)
  - 75mm 45 to 55 hours (3 days)

TekmaHeat

THERMOWOOD® PROCESS



Combustion/
Chem.
Changes

JARTEK

ThermoWood® Modification Results

- Colour Change
- Increase in Stability (permanently lowered EMC)
- Increase in Durability (@230 comparable H3.1)
- Removal of Resin
- Improvement of Thermal Properties (insulation)
- Decrease in Density (brittle)
- Decrease in Strength (non structural)

Tunnicliffe's ThermoWood® Beginnings

Competitive advantage

Problem solving existing problems

- Joinery – instability Radiata pine

Demand for new product

- Beehive Boxes

ThermoWood®
Kiln for Sale
2008

TekmaHeat

JARTEK

ThermoWood® Beehive Boxes

- Chemical free
- Dimensional stability
- Less weight
- Improved insulation

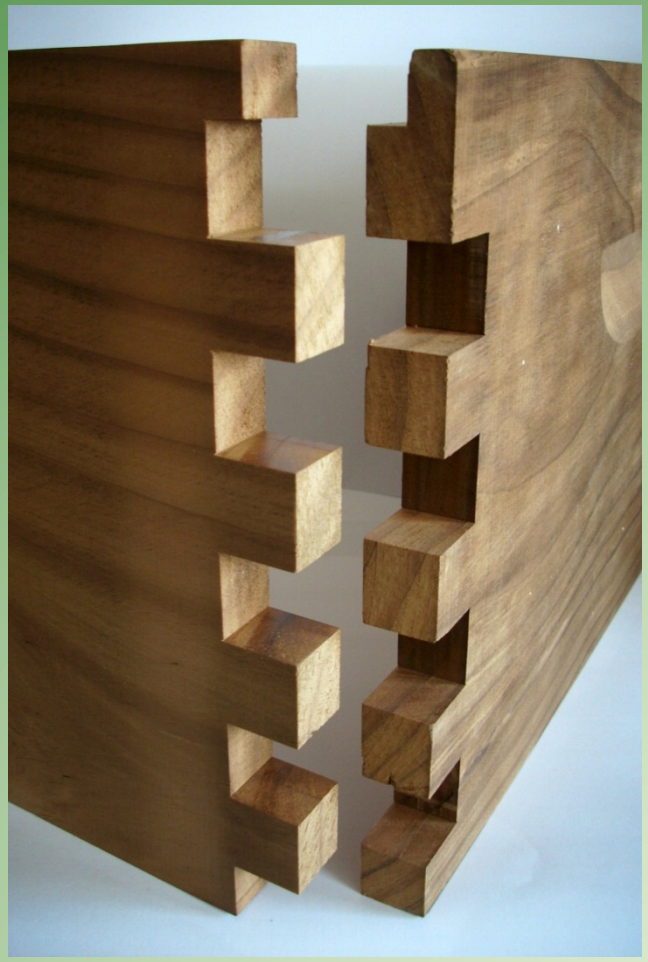
New Products

Building Compliance Exterior Use

- Above ground durability trial Scion Rotorua
- Results after 7 years
- Slightly more durable than H3.1 LOSP treated Radiata pine sapwood and Macrocarpa Heartwood
- NZS 3602:2003
- Requirements components minimum 15 year durability
  - Joinery
  - Weatherboards
  - Facia
- Paint Quality

Practical Benefits

- Makes wood more uniform
- Modification right through
- Very good machinability
- Not compromising durability when machining
- Removal of resin resulting in good paint finish



Product Example Timber Joinery

Oversize Interior Doors

- Over 1.2m wide
- Over 2.1m high

1. ThermoWood®230
2. Alaskan Yellow Cedar
3. Western Red Cedar

Product Example Timber Joinery

Large Window Sills

- Stability
- Machinability
- Paint adhesion

- Alternative to Native Hardwood
- Large dimensions
- High exposure
- No finger-joints
- No lamination

Product Example Timber Joinery

Mullions

- Solving production issue
- Straight
- Stiff
- Light

Product Example Timber Joinery

Rebated Jambs

ThermoWood®230

- 97 x 22 mm

H3.2 Tan® Ecowood™

- 50 x 15 mm

Comparison

Western Red Cedar

- Imported Species
- Expensive
- Variable Pricing
- Variable Quality
- Machining Ok (chipping)
- Hard to paint

ThermoWood®230

- Domestic Species
- Less Expensive
- Stable Pricing
- Consistent Quality
- Machining Good (less chipping)
- Easy to paint

Comparison based on practical Joinery customer feedback only

Conclusion

- ThermoWood®230 well accepted by Tunnicliffe's customers
- ThermoWood®230 has a place in NZ market

With our Radiata pine we have a real option for Down Under to enter the world market with a new timber species

Acknowledgments

- International ThermoWood Association
- Jartek Oy
- Scion
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- Westpine Joinery
- Rockfield Woodworkers
- Magenta Publishing – Joiners Magazine