

INTERNATIONAL

Thermo**Wood**

ASSOCIATION

International Forum on Wood Modification
29.10.2019



Jukka Ala-Viikari | 2019

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2. ThermoWood® Concept
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International ThermoWood Association (ITWA)

- Established in 2000, registered in Helsinki, Finland

- The tasks of the ITWA are:
 - To increase knowledge concerning thermally modified timber
 - To enhance the use of thermally modified timber (TMT)
 - Common lobbying of the members

- Key activities:
 - Lobbying
 - Communication
 - R&D
 - Supervise quality control of the ThermoWood® production

Association

Members

(logo is a link to the website of the company)

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ThermoWood
ASSOCIATION

ThermoWood producers (16)



Mazand Choob Aria
highest quality in ThermoWood production



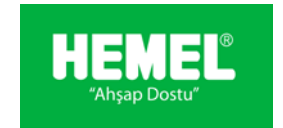
SCOTTYWOOD
INTERNATIONAL



Kiln manufacturers (1)

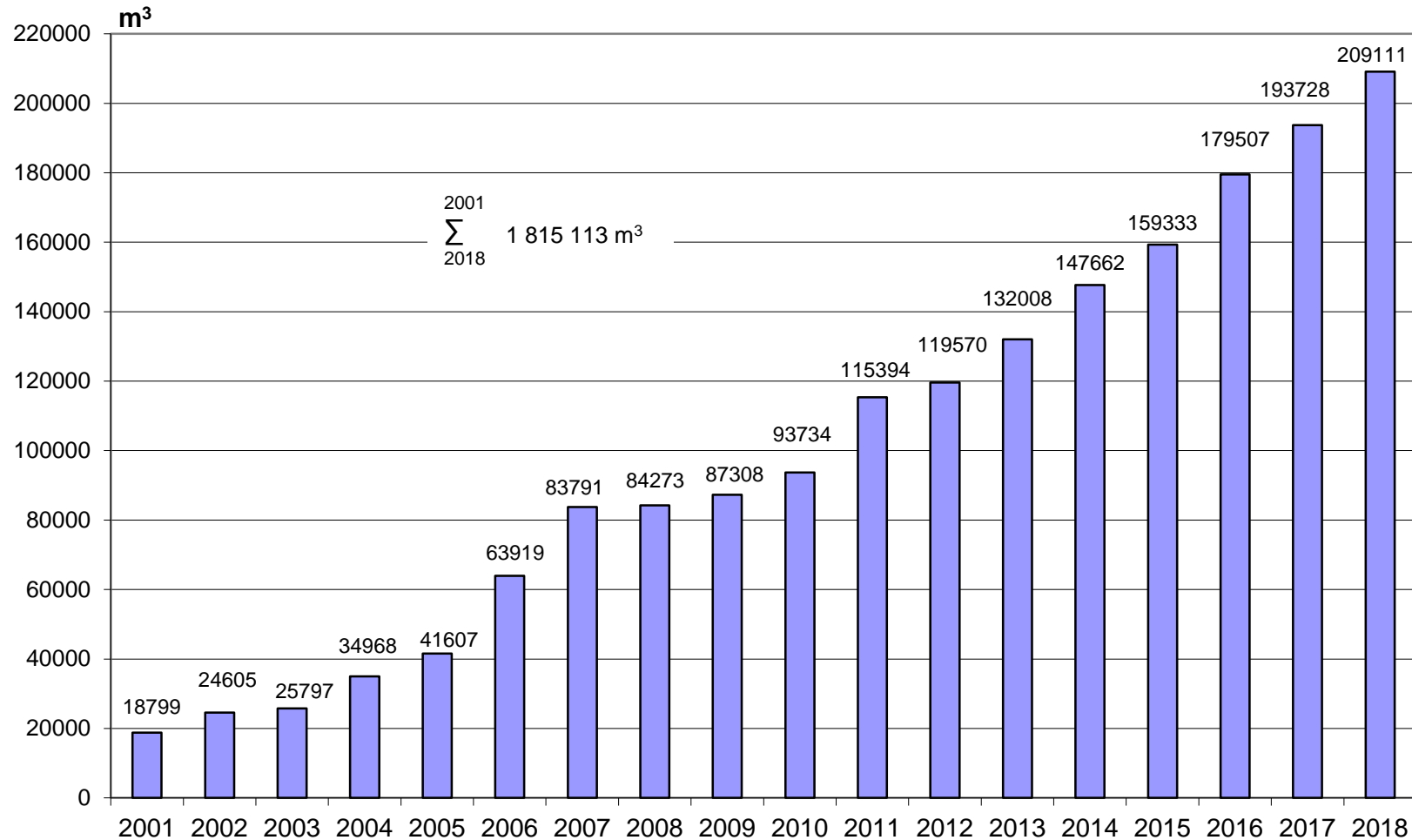


Cooperative partners (6)



Association

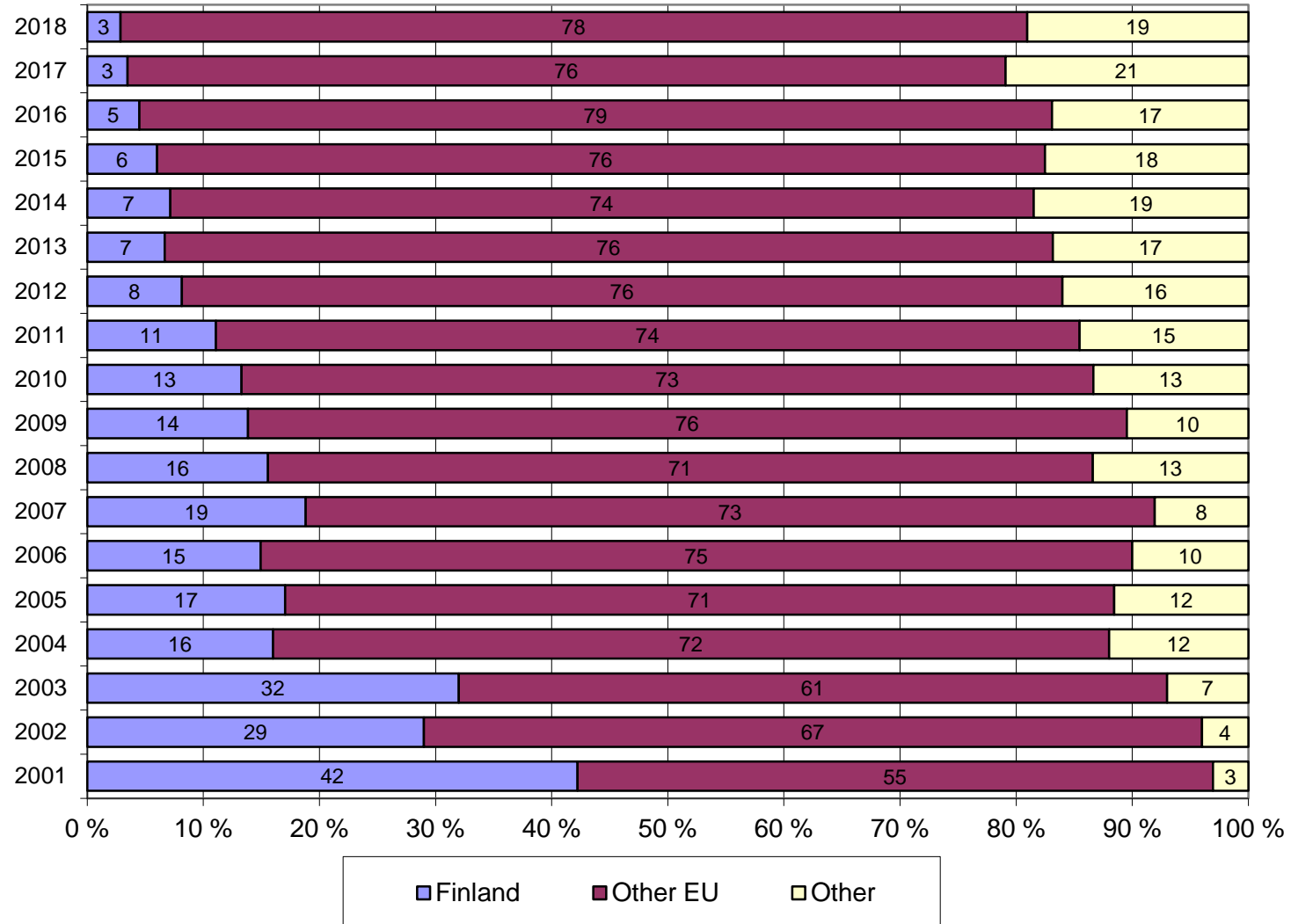
ThermoWood® PRODUCTION



Wood species in 2018	
Pine :	46 %
Spruce:	43 %
Other:	11 %
- Ash	
- Aspen	
- Ayous	
- Beech	
- Birch	
- Frake	
- Iroko	
- Radiata pine	
- J.Ceder	
- J.Cypres	
- Poplar	
- ...	

Association

ThermoWood® MARKET AREA



ThermoWood® Concept

The Concept ensures technical and ecological quality of the ThermoWood® products.

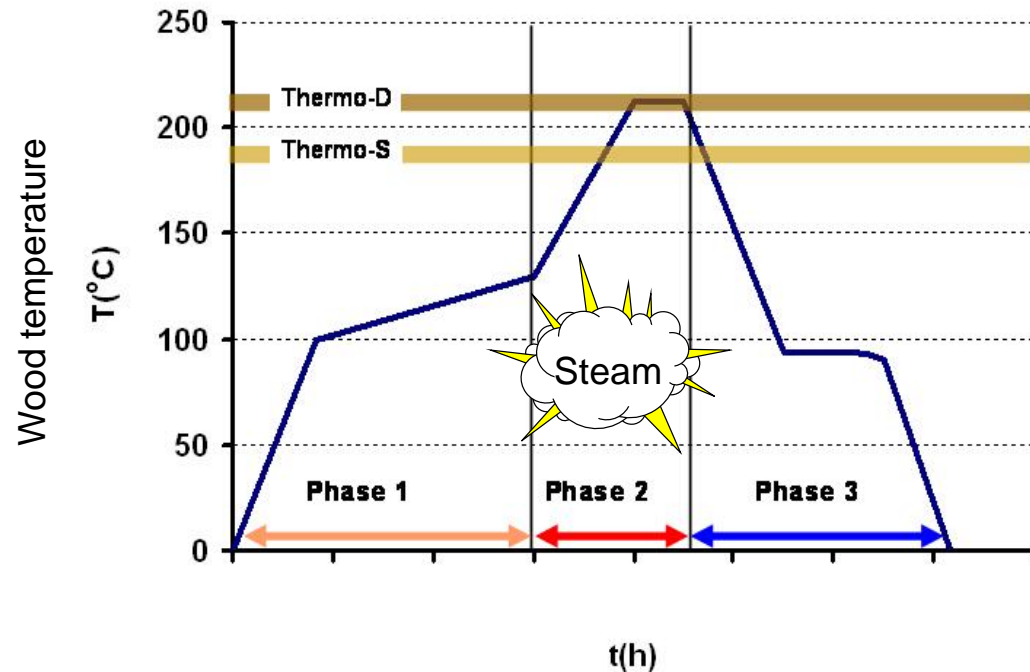
Sections:

1. Patented modification process
2. Registered trademark
3. Quality control system
4. Standardization
5. Certified raw material
6. Life cycle assessment (LCA)
7. Research & development (R&D)

ThermoWood® Concept

1. Patented ThermoWood® modification process

ThermoWood® process was developed in cooperation between industry and research laboratories. The process was patented in 1990's by VTT Technical Research Centre of Finland (www.vtt.fi).



Patents:

- EP0695408
- JP 3585492
- US 5,678,324
- CA 2,162,374

Austria
Belgium
Switzerland
Germany
Denmark
Spain
France
UK
Greece
Ireland
Italy
Holland
Portugal
Sweden
Japan
USA
Canada

Only high temperature and steam used in the modification process.

At the end of service life ThermoWood® can be managed as normal wood.

ThermoWood® Concept

2. Registered trademark and logo

ThermoWood®

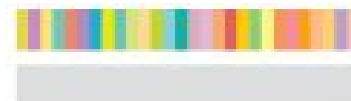


Registration in EU:

- applied in 1998
- registered in 2000

Registered also in:

- Switzerland
- Japan
- China
- Canada
- USA
- Iran
- Russia
- Turkey
- India
- Australia
- New Zealand



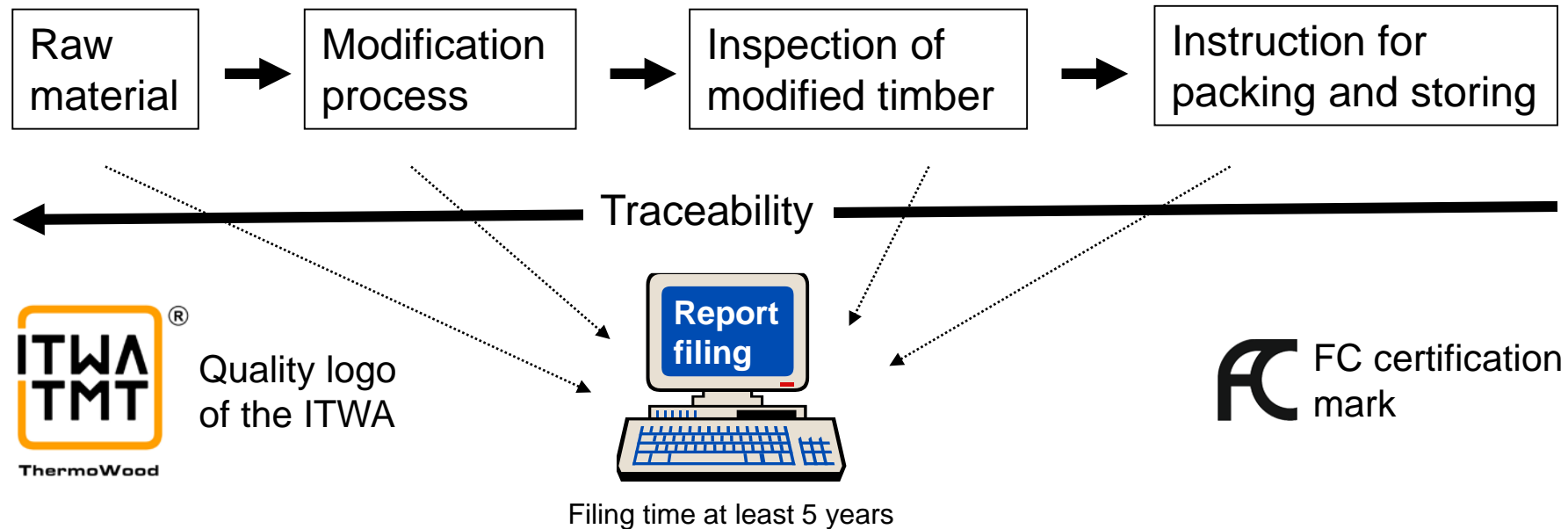
Member States of the European Union

Candidate countries and potential candidates

ThermoWood® Concept

3. ThermoWood® quality control system

- Created in cooperation between research laboratories and ThermoWood® industry
- Implemented in 2006
- Audited by third party
 - auditor: Finotrol Oy (www.finotrol.fi)
 - manual: FC-2 Thermally Modified Timber (TMT)



ThermoWood® Concept

4. Standardization

- ThermoWood® classification
 - Thermo-S ("Stability")
 - Thermo-D ("Durability", durability class 2)
- CEN/TS 15679:2007
Thermal Modified Timber - Definitions and characteristics
 - approved in 2007
 - national implementation in 2008



Photo: Velux A/S

ThermoWood® Concept

5. Certified raw material

The issue is that raw material comes from sustainable sources.



ThermoWood® Concept

6. Life cycle assessment (LCA)

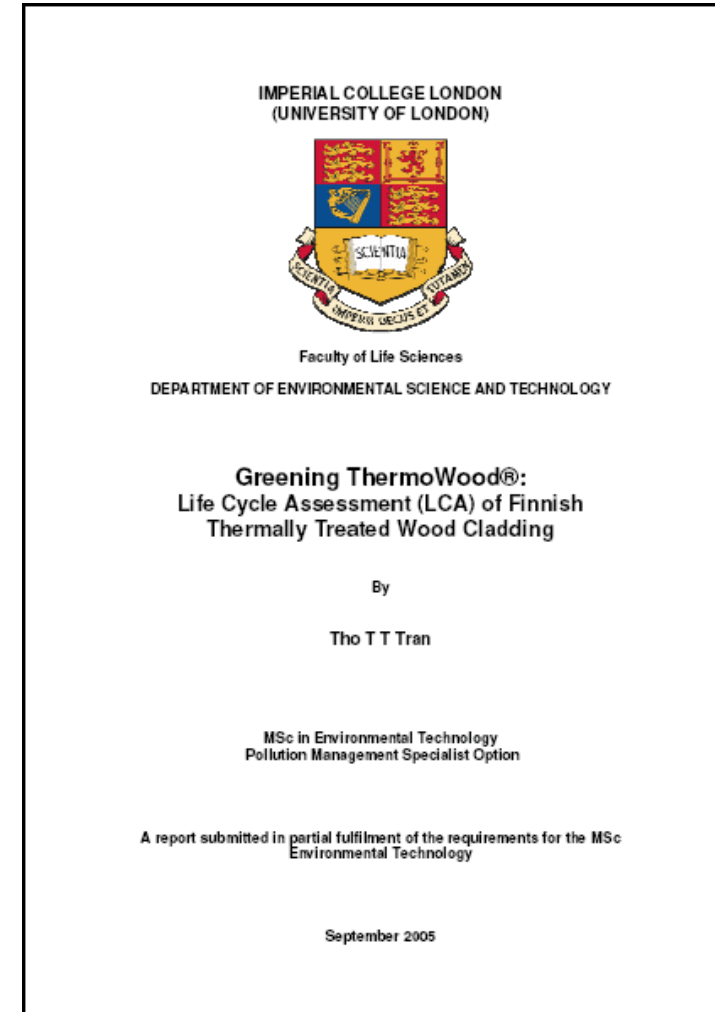
LCA study of ThermoWood® was carried out in cooperation with Imperial college London

Conclusion:

” ThermoWood® has a potential of being a ‘green’ building material if consideration is made to the production as well as the use and disposal at the end of its life cycle using best available technologies”

Carbon Footprint of ThermoWood® project was carried out in cooperation with Satakunta University of Applied Sciences

The total CO2 amount from whole production and logistical cycle in kilograms per one solid cubic meter of final product were calculated.

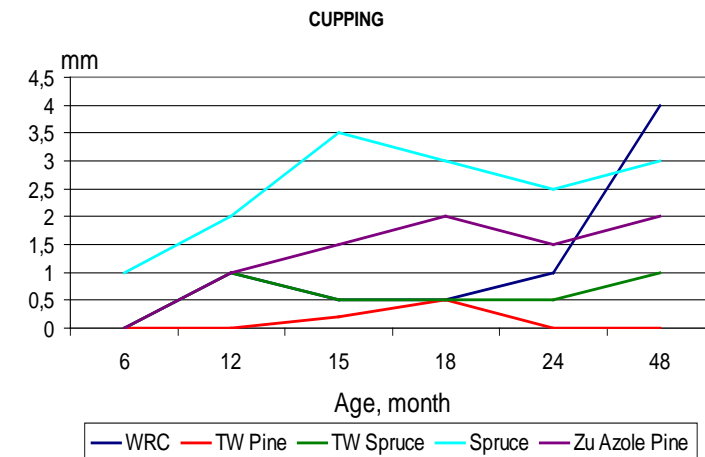


ThermoWood® Concept

7. Research & development (R&D)

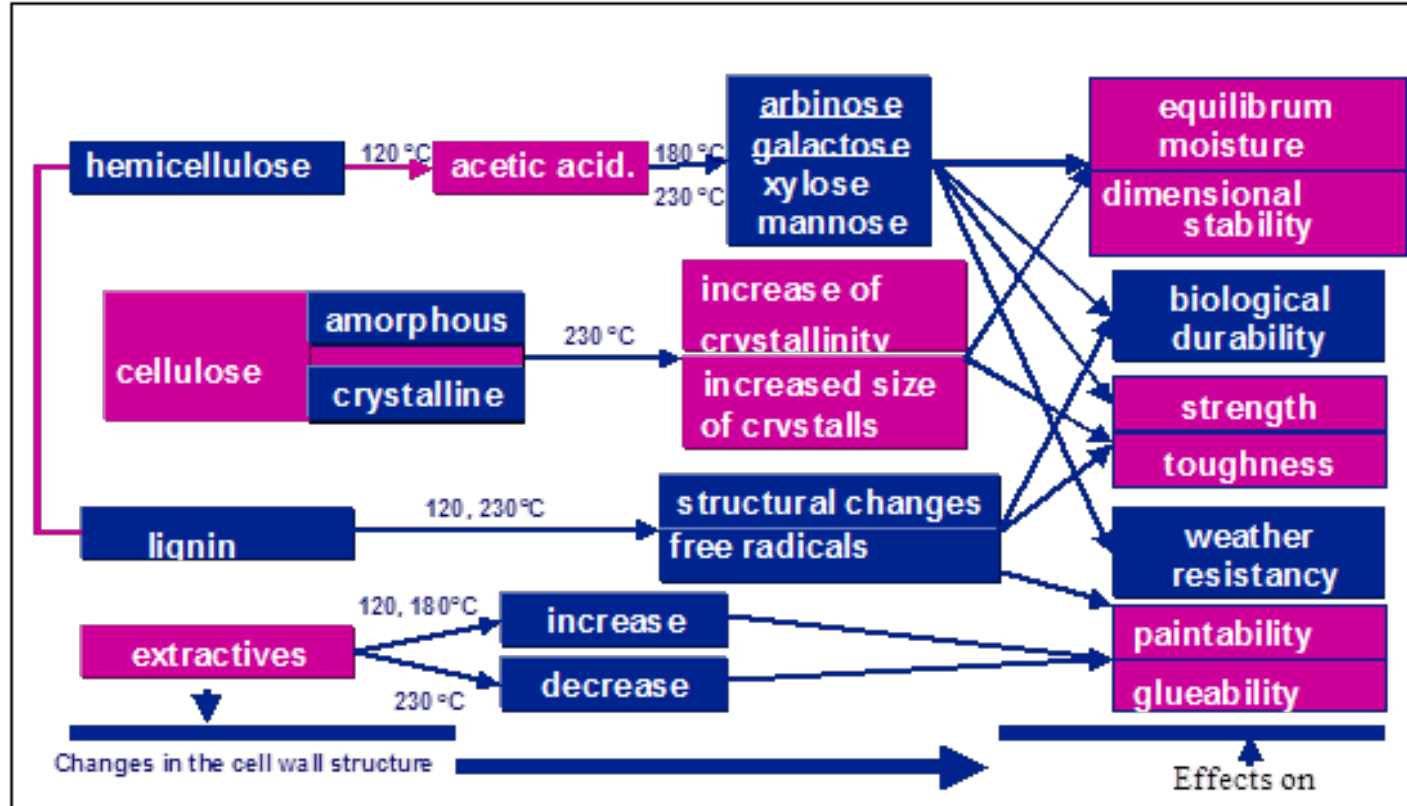
International ThermoWood Association annually allocates resources for topical R&D projects.

International cooperation.



ThermoWood® properties

Chemical changes

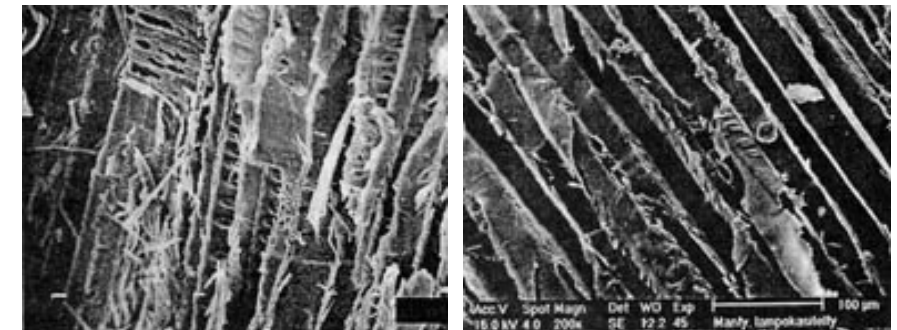


Reaction mechanisms of thermally modified timber (VTT)

Thermal modification causes changes in main components (cellulose, hemicelluloses, and lignin) of wood.

The process temperature and duration effect different ways. Long modification time does not compensate high temperature.

Microscope

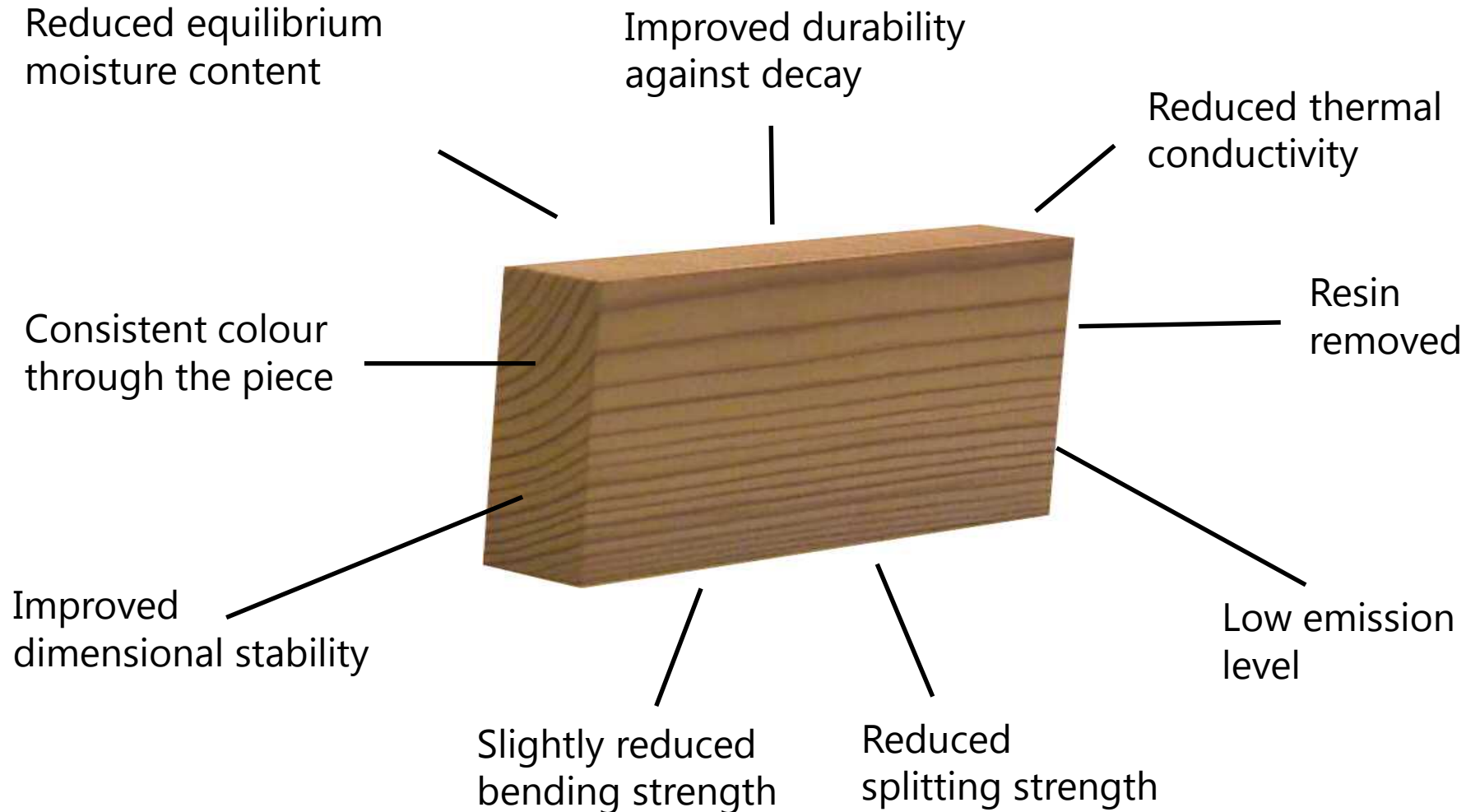


Unmodified Pine

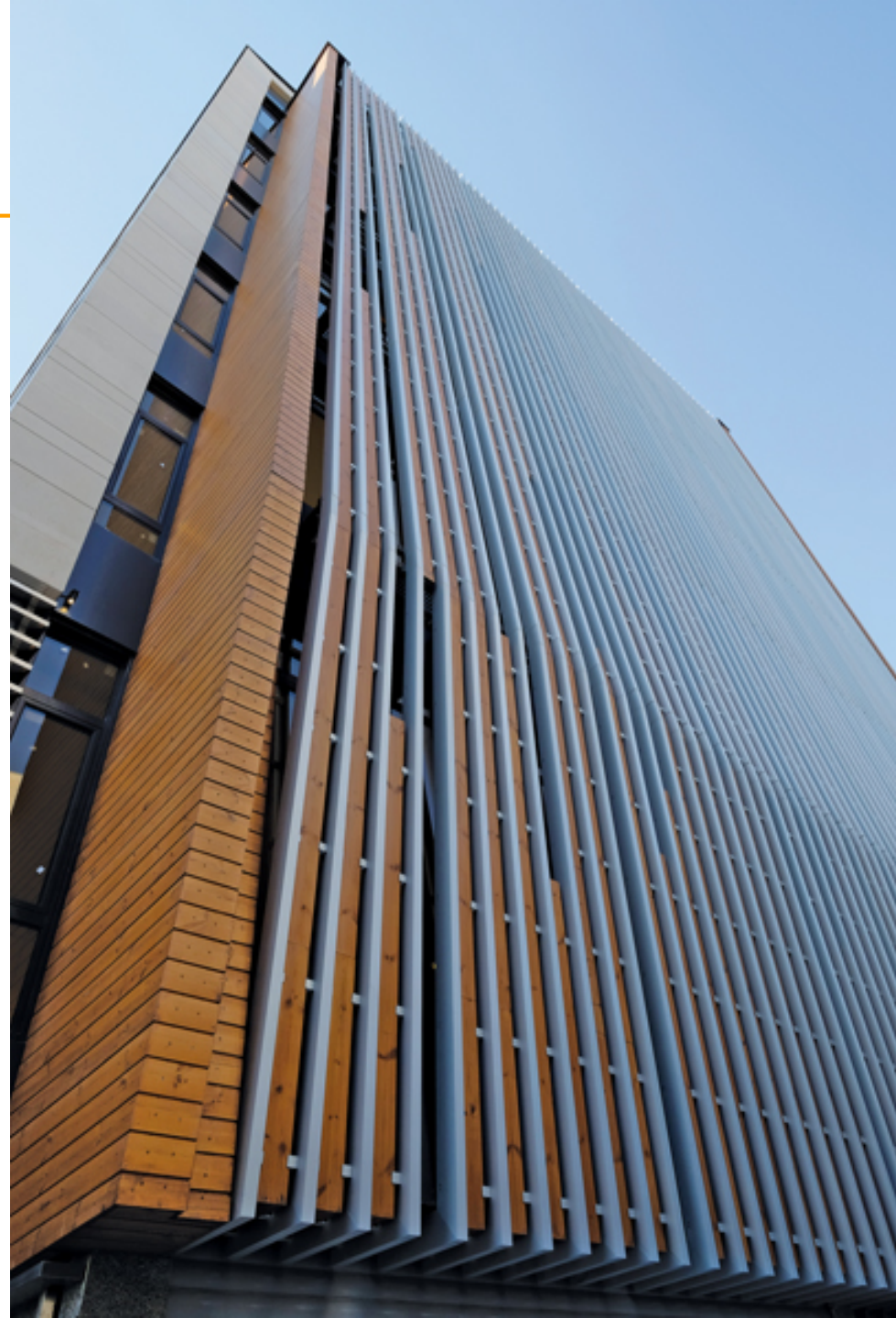
Thermally modified Pine

ThermoWood® properties

Physical changes



References



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Cladding

Product: Pine, Thermo-D

Location: Tehran, Iran

Photo: Lunawood

References

Cladding

Product: Pine, Thermo-D

Location: Helsinki, Finland

Photo: ThermoWood Association



References

Cladding

Product: Spruce, Thermo-D

Location: Punkaharju, Finland

Photo: Stora Enso



References



INTERNATIONAL
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Cladding

Location: Turkey

Photo: Novawood

References



Cladding

Material: Spruce, Thermo-D

Location: Sweden

Photo: Stora Enso

References



Cladding and solar shades

Material: Pine, Thermo-D

Location: Finland

Photo: SWM-Wood

References



Decking

Material: Pine, Thermo-D

Location: Thailand

Photo: Lunawood

References



Decking

Material: Pine, Thermo-D

Location: Finland

Photo: SWM-Wood

References



Garden furniture

Product: Pine, Thermo-D

Location: Finland

Photo: ThermoWood Association

References



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Sauna

Product: Pine, Thermo-D

Location: Finland

Photo: Lunawood

References



Joinery, windows

Material: Pine, Thermo-D

Location: Finland

Photo: ThermoWood Association



References



Joinery

Photo: Velux A/S

References



Solar shades

Material: Pine, Thermo-D

Location: Portugal

Photo: Lunawood

References



Indoor cladding

Material: Pine, Thermo-D

Location: Lithuania

Photo: Lunawood

References



Sauna

Material: Radiata Pine

Location: Finland

Photo: Lunawood

References



Ceiling

Material: Spruce, Thermo-D

Location: Austria

Photo: Lunawood

References



Facade and solar shades

Material: Pine, thermo-D

Location: Dubai

Photo: Lunawood

References



Decking

Material: Pine, Thermo-D

Location: Nanjing, China

Photo: Lunawood

References



Facades and decking

Material: Pine, Thermo-D

Location: Finland

Photo: Lunawood

References



Solar shades

Material: Pine, Thermo-D

Location: Lithuania

Photo: Lunawood

References



Decking

Material: Pine, Thermo-D

Location: Finland

Photo: SWM-Wood

References



Cladding

Material: Pine, Thermo-D

Location: UK

Photo: Lunawood

References



Stairs and decking

Material: Pine, Thermo-D

Location: Finland

Photo: Lunawood

A large wooden hot tub is the central focus, situated on a multi-level wooden deck. To the left, a wooden lounge chair with a cushion is positioned near a tree trunk. In the background, another lounge chair is visible. Two black lanterns with white candles are placed on the deck in front of the hot tub. The scene is set outdoors with trees and a building in the background.

**THANK
YOU!**

WWW.THERMOWOOD.FI