

TV4NEWOOD

- THERMO-VACUUM**: new process for a new generation of thermally modified wood

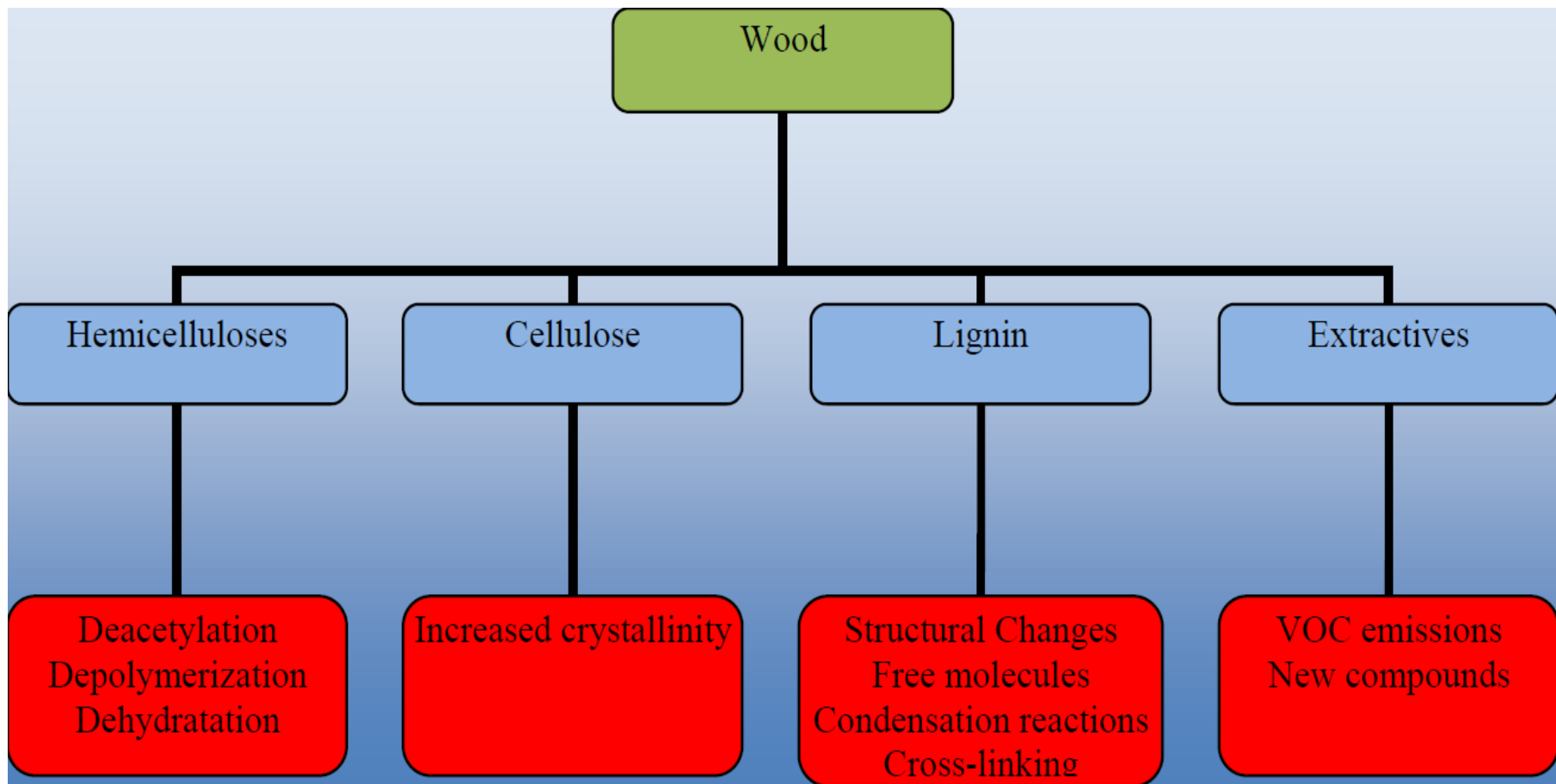
Ottaviano **Allegretti** CNR-IVALSA

LABESS- Lab. of wood drying and modification

THERMO-VACUUM SYSTEM



THERMO-VACUUM is a technology for thermal modification of wood developed by **CNR-IVALSA** with technical cooperation of **WDE-MASPELL**



Decrease the H/L ratio

TV- Features

- **Atmosphere:** partial vacuum (150 mbar, O₂: 1,5%)
- **Convective heat transfer** by means of high efficiency fans
- **Dry process** no use of water or steam
- **Open system** gas from wood removed by vacuum pump

Benefits

- **Improved** stability, durability
- Relatively **cheap** technology

- **Low energy** consumption process (340 kWh)
- **Mild degradation** (low ML, moderate mechanical loss)
- **No odour** of modified wood
- **Eco-friendly** process /product

ThermoVacuum⁴ newWOOD



PROJECT REF. TV4NEWOOD Eco/12/333079

www.tv4newood.it

The **TV4NEWOOD** project (2013- 2106) has been approved for EU funding through the **Eco Innovation program**, (2012 edition).

The project foresees the introduction on the market of TV process for thermal modification of wood.

The project aim to develop TV process for **several available European species** for high quality product as a substitute of some imported tropical species.



Co-funded by the Eco-innovation Initiative of the European Union



SPRUCE,
FIR,
LARCH,
MARITIME PINE,
DOUGLAS,

ASH,
OAK,
BEECH,
POPLAR

Optimisation of
process
parameters
(*T,t,p*)

For the best
product/process
performances for
end-use category:

- Colour
- Stability
- Durability

Comparative NT-HT standard tests on small matched samples

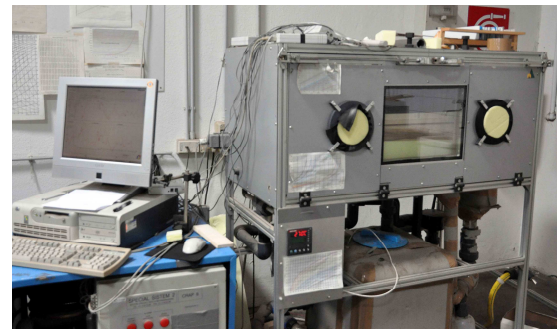
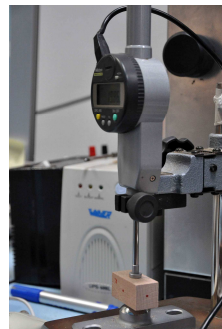
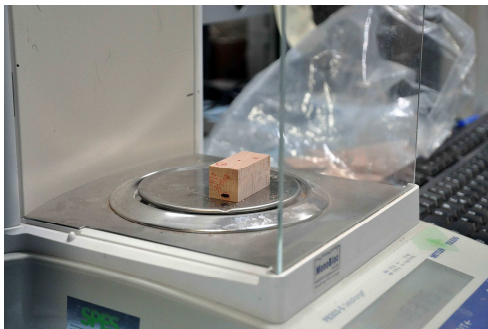
Physical properties
Mechanical properties
Colour
VOC emission
Durability

LCA



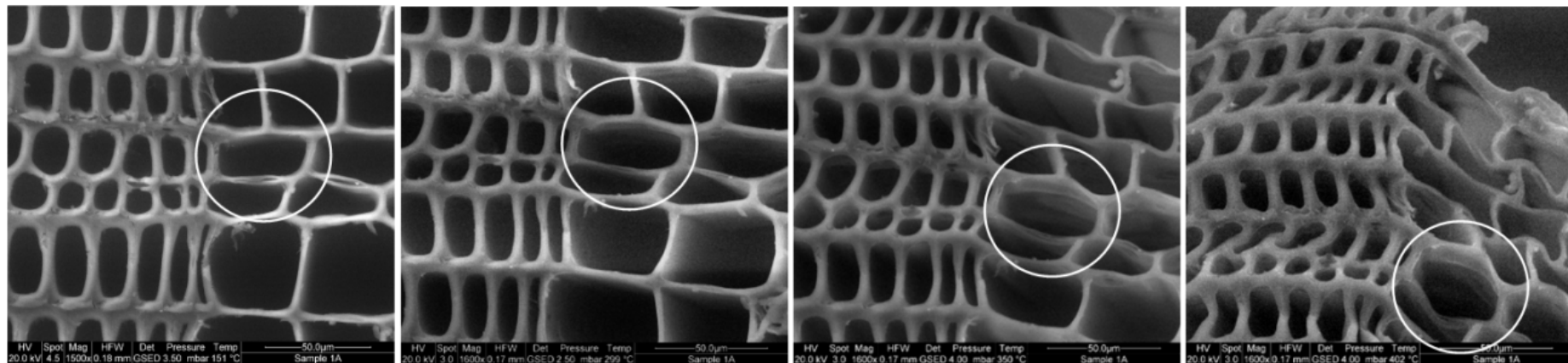
ThermoVacuum⁴ WOOD

eco-innovation 
WHEN BUSINESS MEETS THE ENVIRONMENT



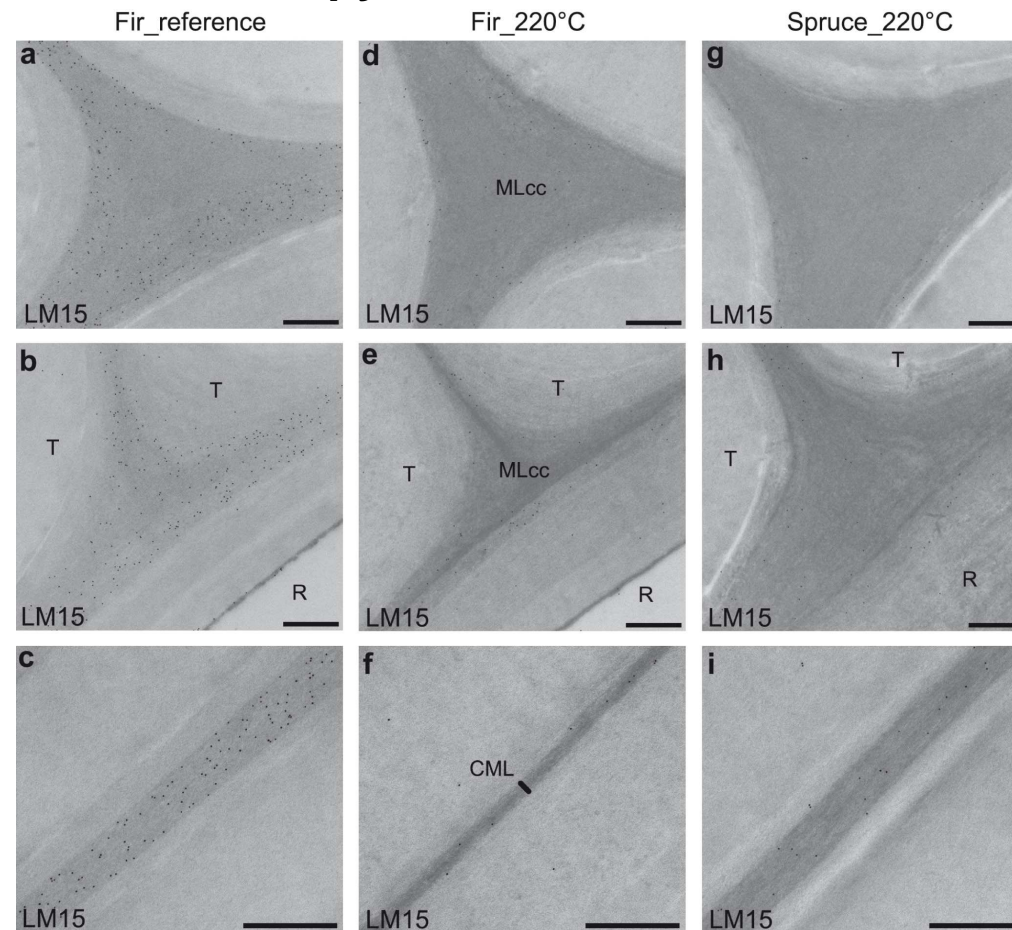
Other investigations

TH-ESEM Thermo Environmental Scanning Electron Microscope



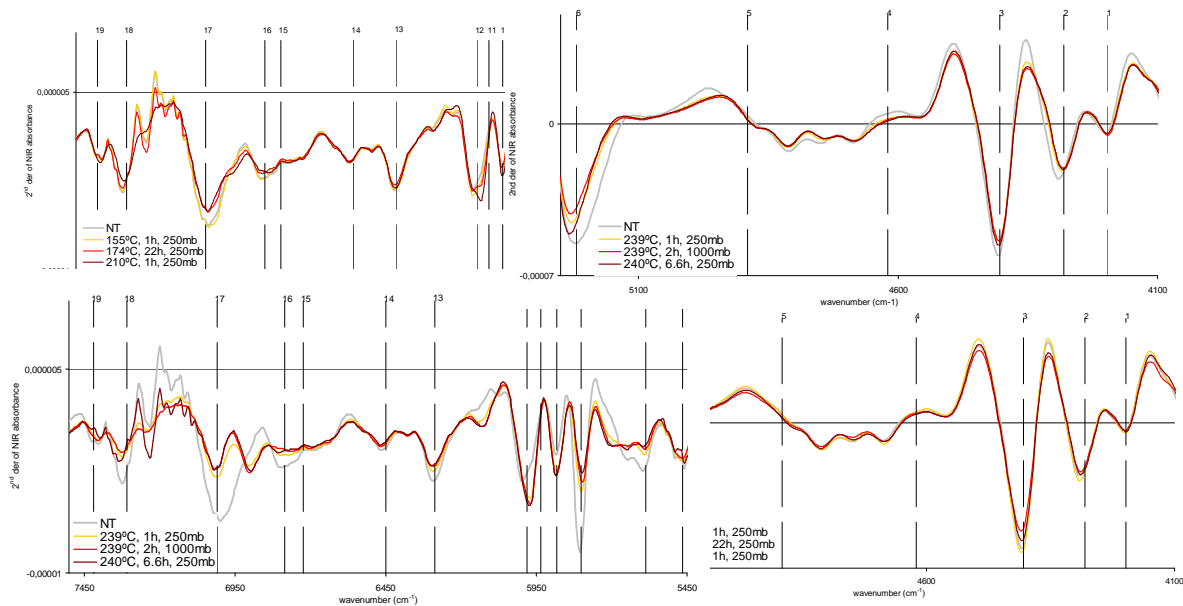
Other investigations

Histochemical Microscopy



Other investigations

NIR

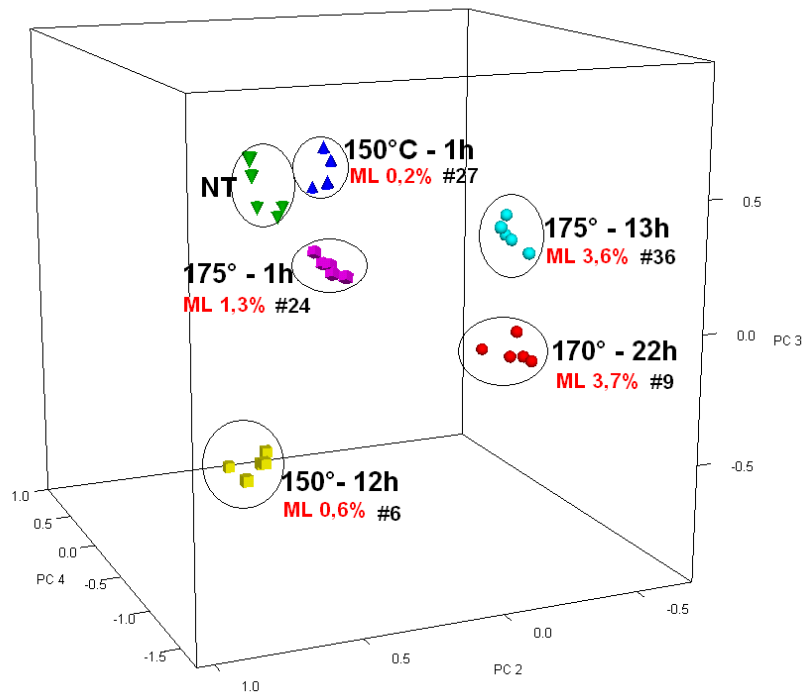




Vac wood

Quality label

Procedure for control of
quality and compliance of
product/process



PCA on NIR spectra

Robust models to cheaply and easily assess intensity of modification and measure the product residual properties