



# Micro-mechanical Behaviour of Green Bonded Finger Joints

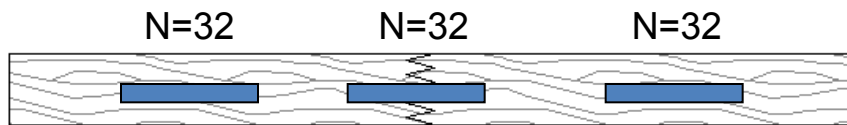
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# Experimental design

- Wood is a highly hygroscopic organic material, which can have high intrinsic moisture content. Recently, a one-component polyurethane adhesive has been developed for effective bonding of “green wood” with moisture contents above 70%.
- *90 timbers, section 50\*150mm<sup>2</sup>, from pallet manufacture (Beynel Manustock).*
- *Defected and finger jointed on green wood, Dried for testing on tensile tests,*
- *Sample were tested in traction associated to an extensometer and IR camera on finger jointing, and Digital Images Correlation principle,*



*Experimental design*



*Picture of the green Finger joint*



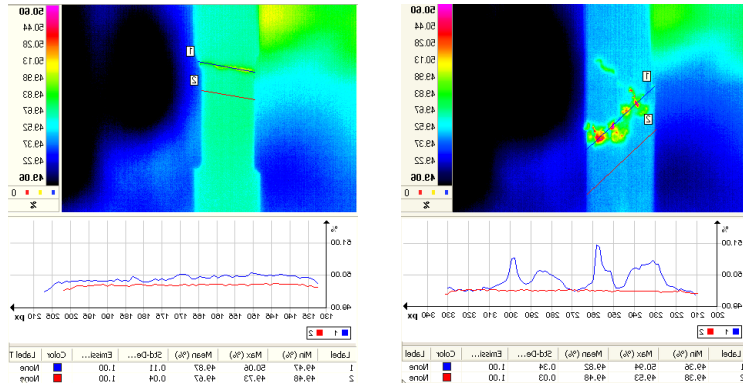
*Test of the green Finger joint*

## *Results*

- *Breakings in wood*
- *MOR of finger jointing zone is statistically similar to raw wood (Variability around 15%)*

# Results and interpretation

*Specimen of a green formed finger joint and failure concentration*

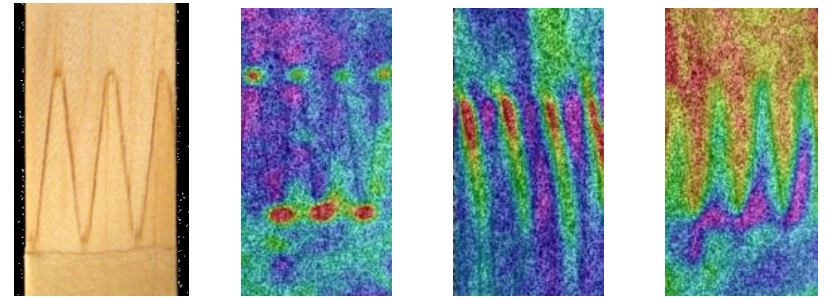


Left: green glued specimen;  
no defect

Right: defect – tip gap-;  
producing local damage

- In comparison to dry-formed finger joint, no elevation of temperature could be detected along the green on.*
- This comparison suggested that a continuous glue line is created in green finger jointing process.*

*Specimen of a green formed finger joint and sample strain concentration maps:  $\epsilon_{yy}$ ,  $\epsilon_{xx}$  and  $\epsilon_{xy}$*



- Same type of sample were tested in traction associated to optical measurement based on the Digital Images Correlation principle on finger jointing,*
- The optical measurements revealed development of local strain concentrations*
- poor load transfer at the finger tips even in the green formed joints.*