

Study of the stress-grading of poplar for a structural use

IPC Working Party on Harvesting and Utilization of
Poplar and Willow Wood

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on Poplar/willow Wood**

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Regional context

- Small sawmills (less than 2500 m³/year)
- Mostly palette production
- Difficult to known exactly the clone
- Important mechanical differences between clones

Grading

- The previous structures build and tested oblige us to grade every pieces of poplar used in the structure





Method evolution

- Loaded by hands with sandbags
- Pneumatic bending (only thin pces)
- Hydraulic bending computer controlled
- Modulo automatic machine 4 pces/min

Object of this study

- Relation between high speed test ,wet and dry, and EN408.
- grade poplar wood only with MOE
- Validate a simple low cost method
- The clone is unknown

Clones tested

- Robusta
- Trichobel
- Flevo
- Koster
- Ghoy
- Dorskamp

Test procedure

- Each trunk was cut in 2,5m logs. The sawn timbers, before drying, were 72 mm x72 mm
- 1483 samples
- High speed E wet
- Timbers were kiln-dried 15 to 18% and planed at 60x60 mm
- High speed E dry
- MOE and MOR according to EN 408
- The wood density, the knot distribution, and the growth rings dimensions were registered.

High speed 3points bending machine



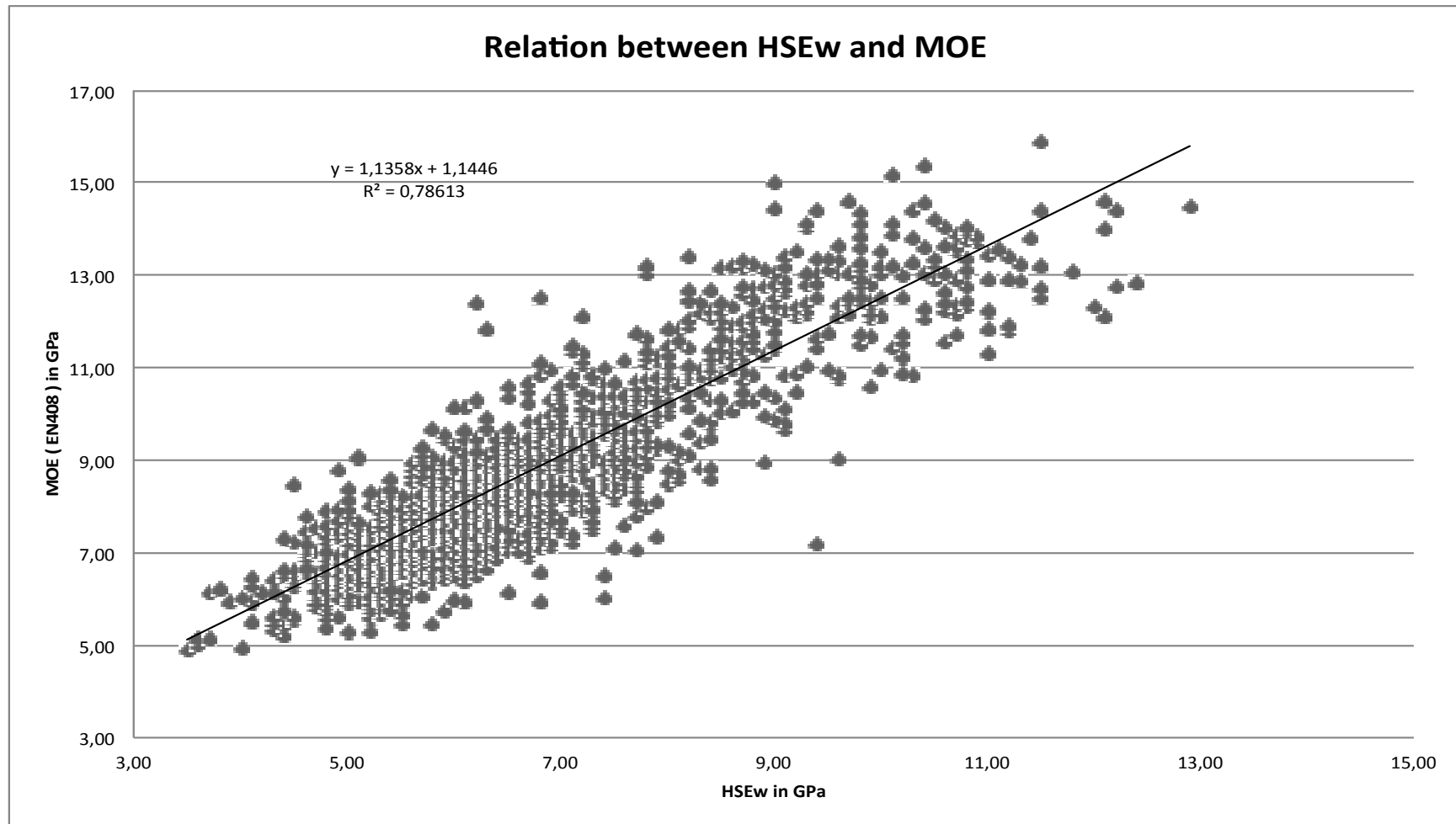
Ultrasound speed

- To complete the investigation the ultrasound speed was tested by a portable Sylvatest
- No correlation between ultrasound Speed and MOE was found.

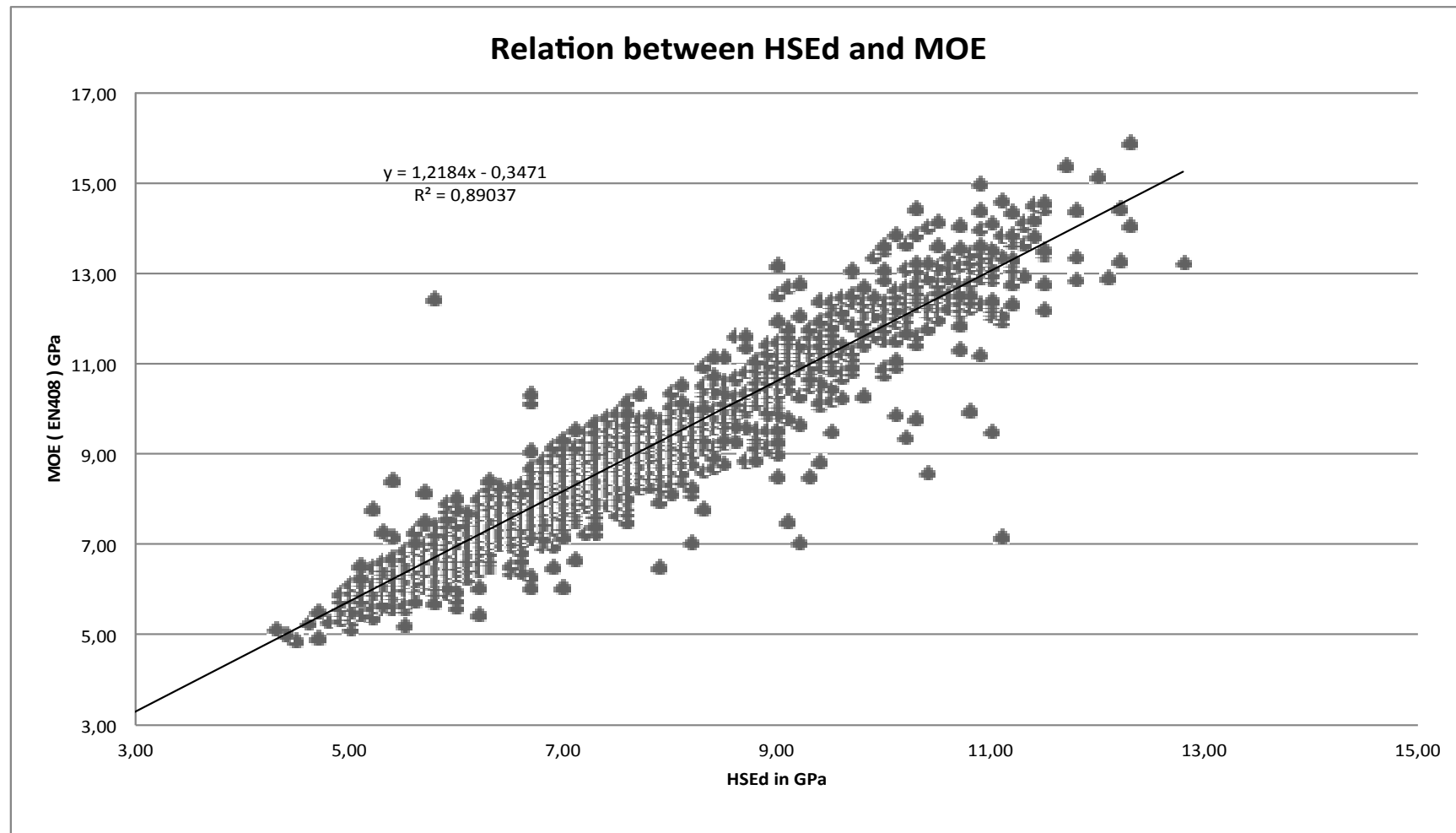
Results

- Density and knots are not relevant
- The MOE is relevant for grading poplar. As soon as MOE fits to EN 384 specifications, MOR is higher than request

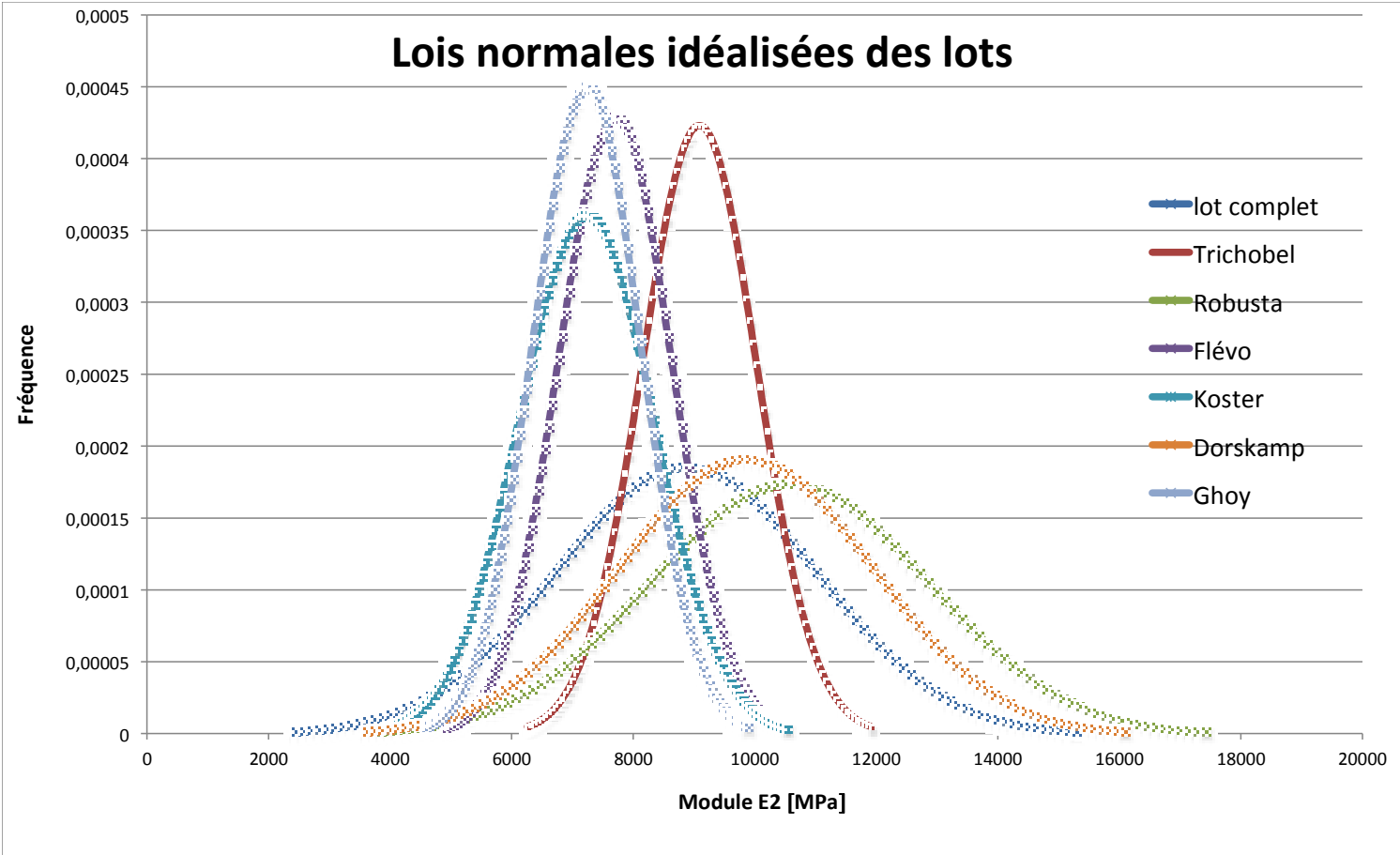
The coefficient of determination is, in the case of non dried wood, 0,786.



The coefficient of determination is, in the case of dried wood, 0,890.



MOE distribution for each clone



conclusions

- The high speed 3 points bending test gives very reliable results and is not dependent of the clone
- This method is cheap and easily mountable in the local sawmills and it will not be an obstacle to the production output.

Thank you for your attention.