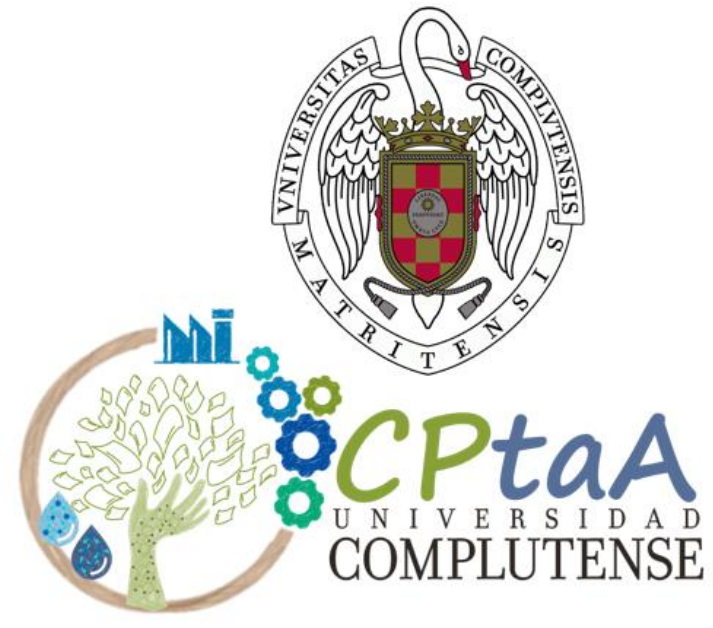


ReDesigning Construction Materials Using Hot-pressed Reinforced Papers

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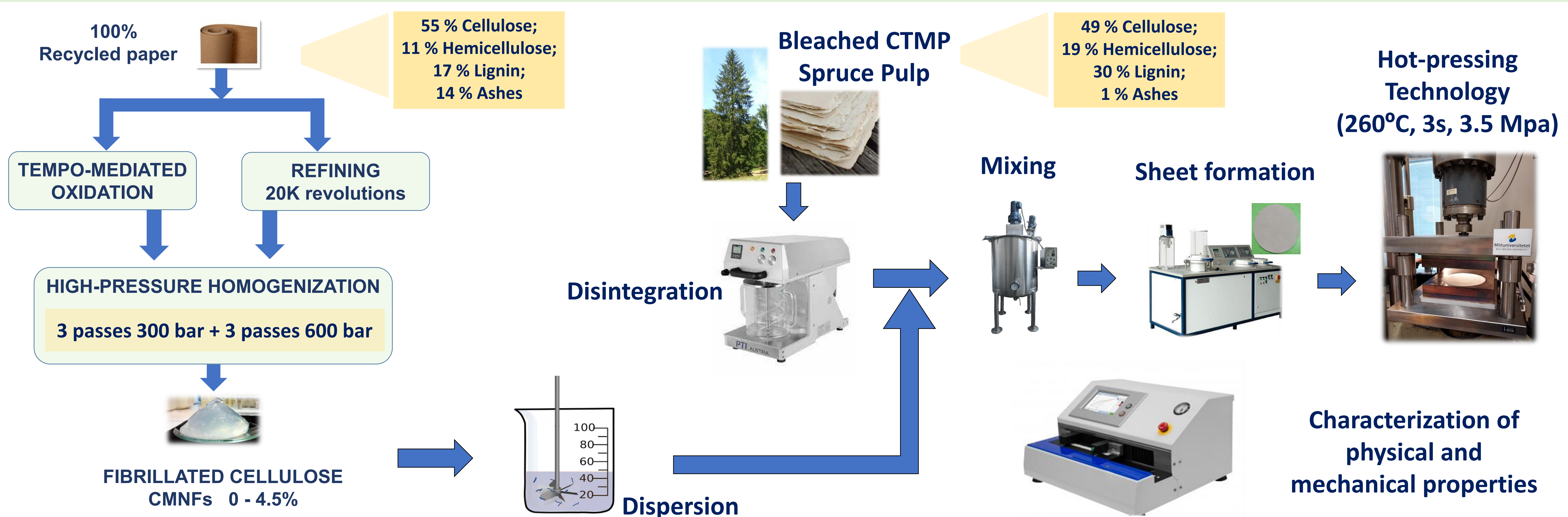
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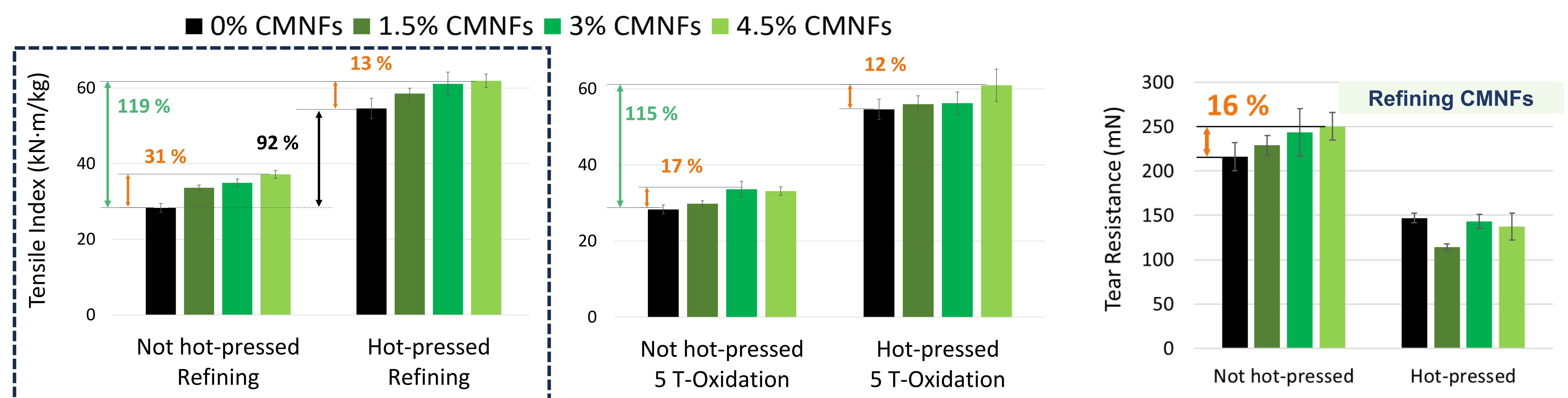


Society is demanding bio-based, recyclable construction materials. In bio-based heating floors, plastic can be replaced by specialized paper with improved mechanical properties

The synergic effect of improving the mechanical properties of papers by combining the reinforcement effect of fibrillated cellulose (CMNFs) and hot-pressing is evaluated
The effect of the CMNF pretreatment on paper properties is assessed



CMNFs enhance the mechanical properties of paper sheets after hot-pressing



Similar effects with refining/TEMPO CMNFs
but mechanical nanofibers are cheaper

Wet Tensile Index
Bleached CTMP: No wet strength
Bleached CTMP + 3 or 4.5% CMNFs + Hot-pressing: >22% of the dry tensile index

Conclusions

- Strong synergy between the use of CMNFs as reinforcement and hot-pressing, enhancing products with high wet and dry strengths even when using low-cost CMNFs produced by refining
- 119% increase in dry-strength, with improved wet-strength corresponding to 22% of the dry strength
- Although the tear index increases with the addition of CMNFs, this effect is lost after hot-pressing
- Hot-pressed papers can be used to reinforce boards for underfloor heating systems, making them recyclable after use



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