

Green composites: Challenges to reach high performance components

S. Lloret Pertegás¹, A. Anusic², K. Resch², R. Schledjewski^{1,3}

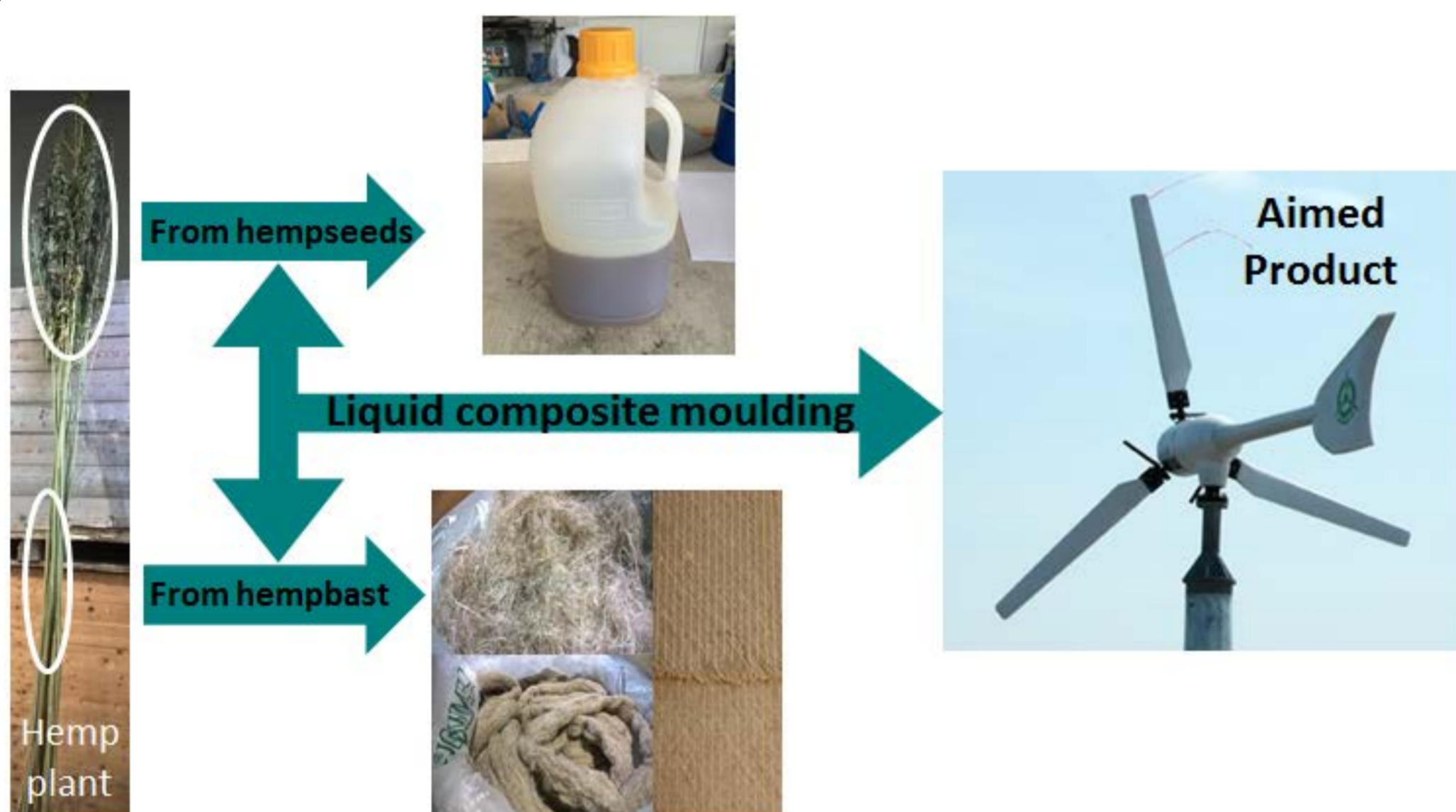
¹ Christian Doppler Laboratory for High Efficient Composite Processing, Montanuniversität Leoben, Austria

² Chair of Materials Science and Testing of Polymers, Department Polymer Engineering and Science, Montanuniversität Leoben, Austria

³ Chair of Processing of Composites, Department Polymer Engineering and Science, Montanuniversität Leoben, Austria

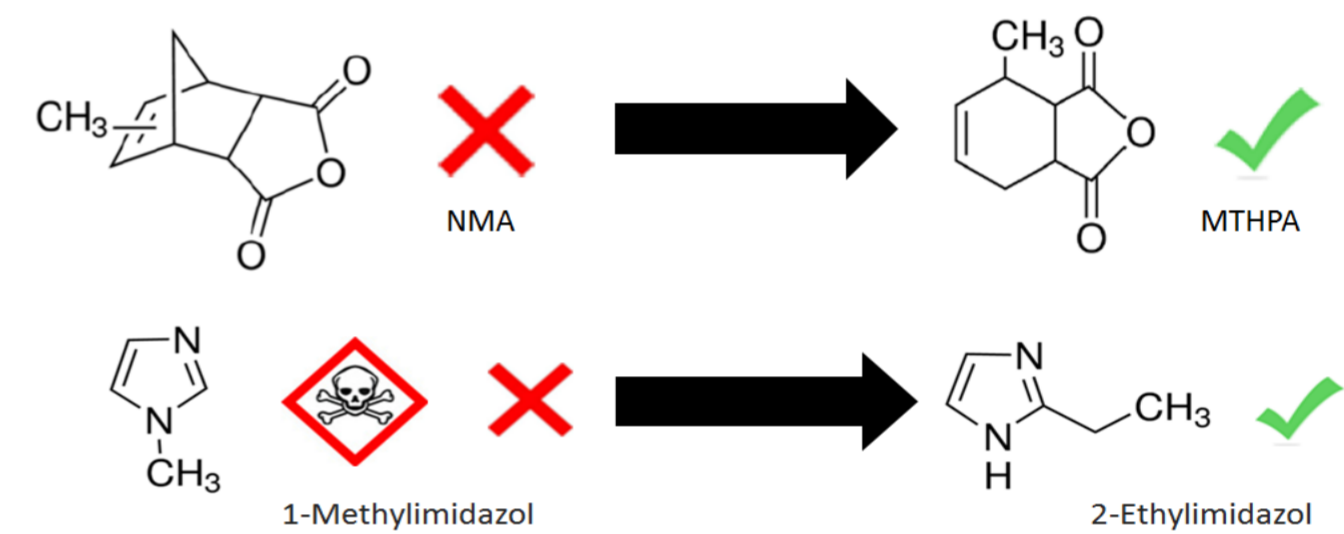
Introduction

The challenging topic in this study, is to find a thermoset resin being completely green, i.e. based on renewable resources and being not critical, e.g. toxic, at any stage of the whole manufacturing process. For this purpose several different approaches are studied and compared with other solutions based on green resin systems from other resources and conventional petrochemical based resin systems.



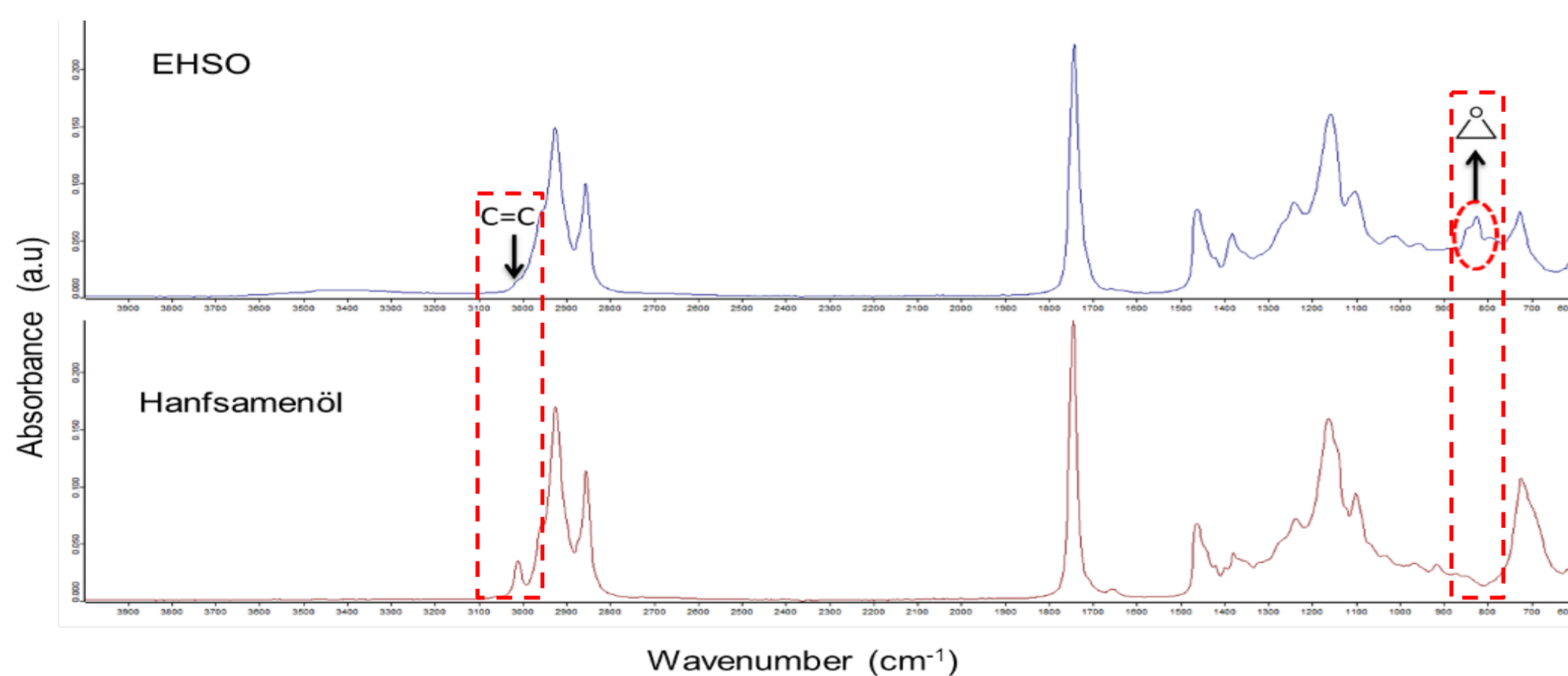
Challenges In Manufacturing

- Manufacturing fully green thermoset resins is still a challenge
- Comparable mechanical properties compared with conventional composites are required
- Reproducibility regarding product properties (lignocellulosic content)
- Difficulties avoiding harmful products, e.g. curing agent and catalysts



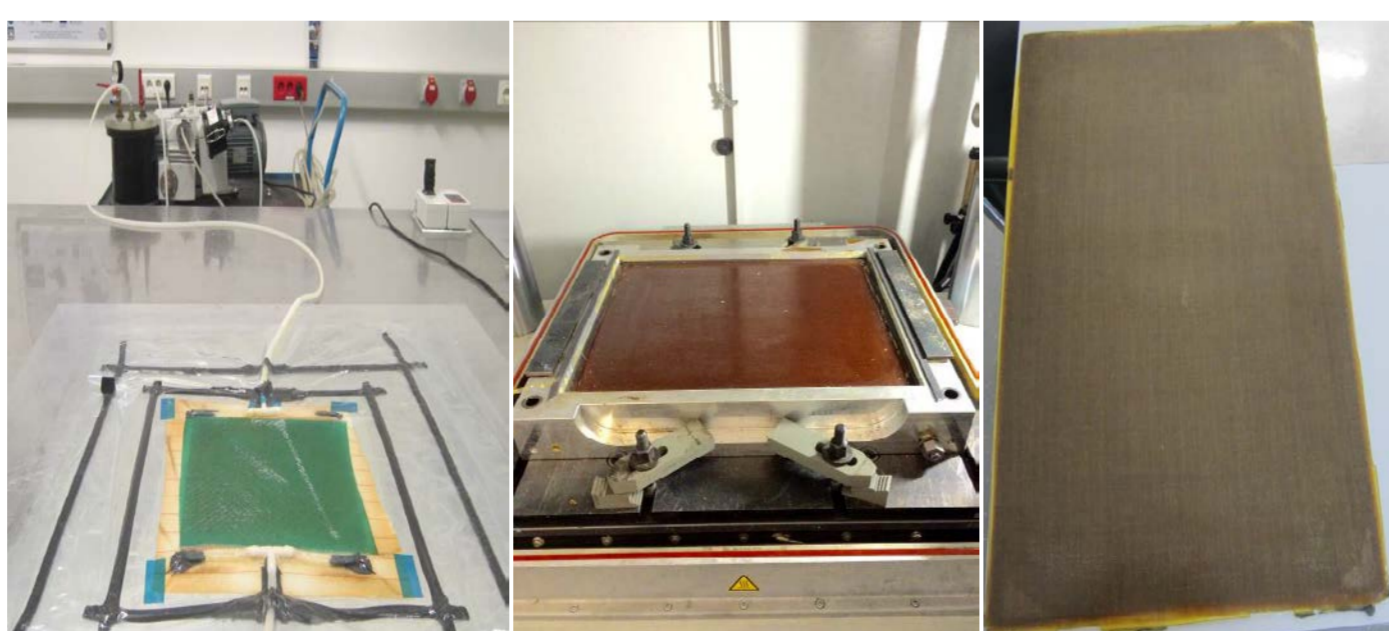
Manufacturing

Harvesting → Cold pressed hempseeds → Hempseed oil epoxidation →
Curing agent and catalyst addition → Bio-based thermoset system



- Product manufacturing

- Vacuum infusion
- Press moulding



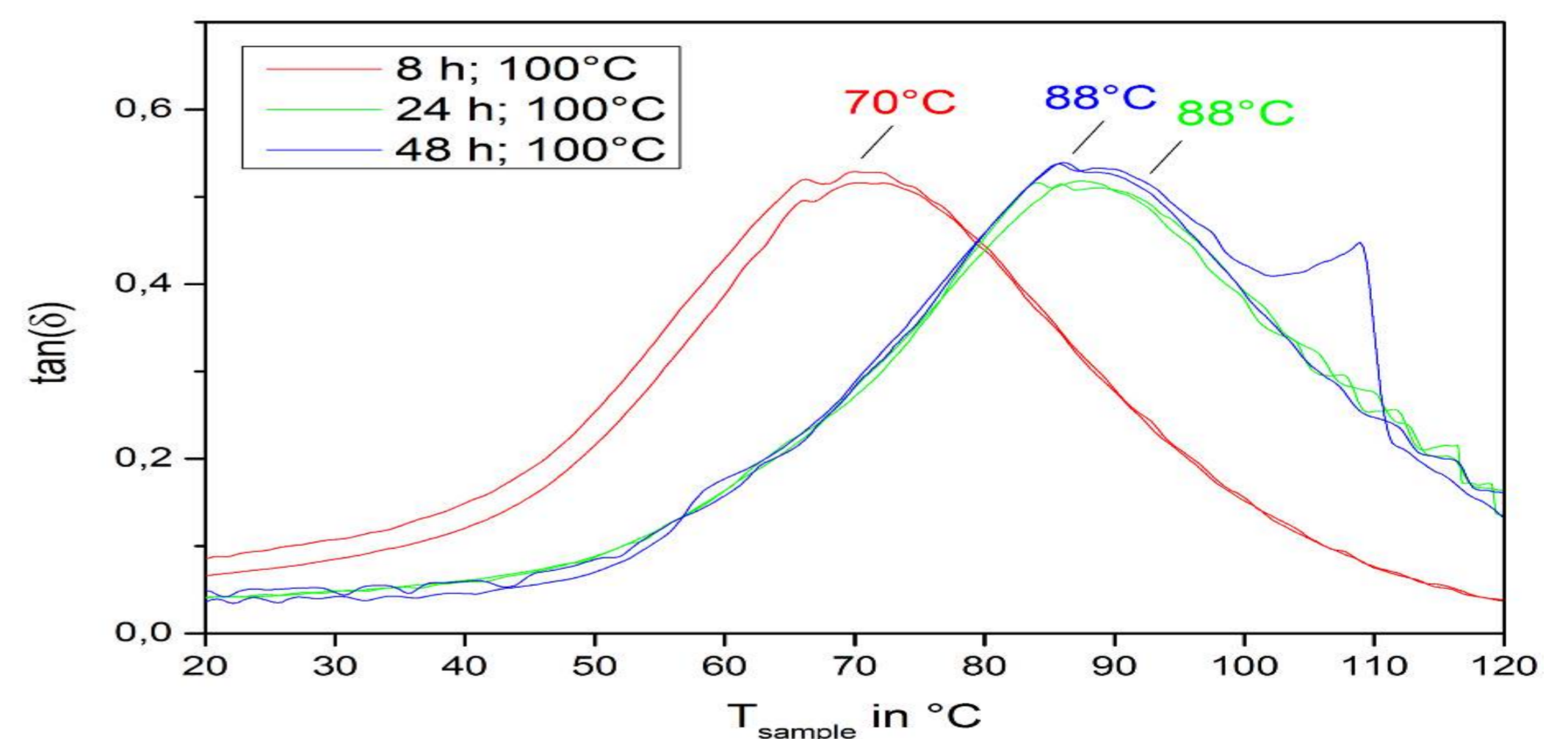
Results and Conclusions

Results

- Influence of the manufacturing parameters was studied
- Thermal characterisation
 - DMA
- From 24 to 48 hours experiments T_g is not rising

Conclusions

- Advantages of bio-composites vs conventional composites
- Thermoset system should be improved
- To be comparable with commercially available curing time should be shorter



Acknowledgement

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