# INFLUENCE OF CELLULOSE NANOPAPER CHARACTERISTICS ON PAPER AND COMPOSITE PROPERTIES

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Cellulose nanofibrils (CNF) have gained significant attention in recent years as reinforcement for the production of composite materials due to their excellent mechanical and chemical properties, with the Young´s modulus even outperforming glass fibres [1]. One promising approach to produce nanocellulose based nanocomposites is to utilize nanopapers as reinforcement in laminated composites, enabling better exploitation of the outstanding mechanical properties of CNF compared to composites in which CNF are introduced conventionally [2].

In this regard, the characteristics of the nanopapers are an important influence onto the composite-properties. One parameter that is anticipated to significantly influence the properties of composites is the porosity of the nanopaper utilized. A low porosity shows high resistance for the resin to enter into the nanopaper structure hence resulting in lower mechanical properties as potentially possible [3]. Our approach was to adjust the porosity of the nanopapers by solvent-exchanging the CNF suspension with various types of organic solvents for papermaking to allow for a better infiltration of the resin.

To produce composites, layers of nanopapers were infused with an epoxy resin by lamination and subsequent hot-pressing. From these composites, specimens for thermo-physical and mechanical measurements were prepared and tested. Results indicated a major impact of the characteristics of the nanopapers on the physico-chemical and mechanical properties of the composites.

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