Stand-up pouches from renewable raw materials and nanocellulose

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Credit: Technical Research Centre of Finland (VTT)

VTT Technical Research Centre of Finland Ltd has developed lightweight 100% bio-based stand-up pouches with high technical performance. High performance in both oxygen, grease and mineral oil

barrier properties has been reached by using different biobased coatings on paper substrate. The pouches exploit VTT's patent pending high consistency enzymatic fibrillation of cellulose (HefCel) technology.

"One-third of food produced for human consumption is lost or wasted globally. Packaging with efficient barrier properties is a crucial factor in the reduction of the food loss. Our solution offers an environmentally friendly option for the global packaging industry", says Senior Scientist Jari Vartiainen of VTT.

VTT's HefCel technology provides a low-cost method for the production of nanocellulose resulting in a tenfold increase in the solids content of nanocellulose. Nanocellulose has been shown to be potentially very useful for a number of future technical applications. The densely packed structure of nanocellulose films and coatings enable their outstanding oxygen, grease and mineral oil barrier properties.

HefCel technology exploits industrial enzymes and simple mixing technology as tools to fibrillate cellulose into nanoscale fibrils without the need for high energy consuming process steps. The resulting nanocellulose is in the consistency of 15-25% when traditional nanocellulose production methods result in 1-3% consistency.

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The stand-up pouch is the fastest growing type of packaging, growing at a rate of 6.5% per year from 2015-2020. Fossil-based plastic films still dominate the packaging market. However, the development of environmentally friendly new materials is of growing importance. Nanocellulose has been shown to be potentially very useful for a number of future technical applications.

VTT has solid expertise in various bio-based raw materials and their application technologies for producing bio-based coatings, films and

even multilayered structures both at lab-scale and pilot-scale. A versatile set of piloting facilities are available from raw material sourcing through processing to application testing and demonstration.

Provided by VTT Technical Research Centre of Finland