

Press release

Scientists upgrading production of cellulose-based electrical insulation components

Cellulose is a common raw material in electrical insulation components. However, the production of high quality products is labour-intensive and slow. Scientists are solving these problems by developing new processing solutions in the EU-funded NOVUM project. Significant improvements will also be made in intensifying resource efficiency and reducing energy consumption and operation costs.

Production of electrical insulation components used in oil-cooled power distribution transformers is a B\$1.19 business globally. The main objective of the NOVUM project is to develop and demonstrate a compact and feasible pilot line concept based on novel processing technologies for the rapid, design-driven production of advanced cellulose-based electrical insulation components. This new pilot line will target significant efficiency improvement and higher productivity and flexibility, while ensuring lower operational costs as compared to the state-of-the-art process.

Manual production will be replaced by an automated manufacturing concept with increased resource efficiency, including a 40% reduction in labour time and a 60% reduction in waste generation, 20% lower energy consumption and a 40% decrease in operating costs.

Processing technologies focused on by NOVUM are the 3D printing of cellulose-based materials with thermoplastic features as well as foam forming and thermoforming of cellulose fibres. These three technologies will be developed in parallel with each other, together with the cellulose materials, in order to reach an optimal combination for the pilot line concept. Besides technical feasibility, the decision on the pilot line concept will be based on the end use requirements as well as on economic, social and environmental impacts including circular economy considerations.

The novel manufacturing concept will also enable the exploitation of the full potential of design in generating form, and thus novel functionalities of cellulose-based electrical insulation components. The concept will be based on multipliable technologies, enabling their transition and wide adoption for cellulose-based materials across the process industry and also for applications in other industrial areas.

The European Commission granted funding to the project “Pilot line based on novel manufacturing technologies for cellulose-based electrical insulation components (NOVUM)” under H2020 SPIRE-09-2017 call. NOVUM is coordinated by the VTT Technical Research Centre of Finland Ltd. The other partners are: ABB (Poland), ecoXpac (Denmark), 3dTech (Finland), RMA (Poland), Vertech (France), Exergy (UK), J. Rettenmaier & Söhne (Germany), Ahlström-Munksjö (France) and AGH University Science and Technology (Poland).

NOVUM started on October 2017 and ends in September 2021.

Further information

VTT Technical Research Centre of Finland Ltd

Research Team Leader, Heli Kangas, Coordinator of the NOVUM project heli.kangas@vtt.fi
+358 400 357 233

Otto-Ville Kaukonieni, NOVUM Project Manager (VTT) otto-ville.kaukonieni@vtt.fi
+358 50 354 4729

NOVUM project: <https://novumproject.eu/>