



INDTECH2018

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PILLAR 2

Session 2.7

Solutions for resource and energy efficient cellulose-based materials in electrical insulation, and beyond

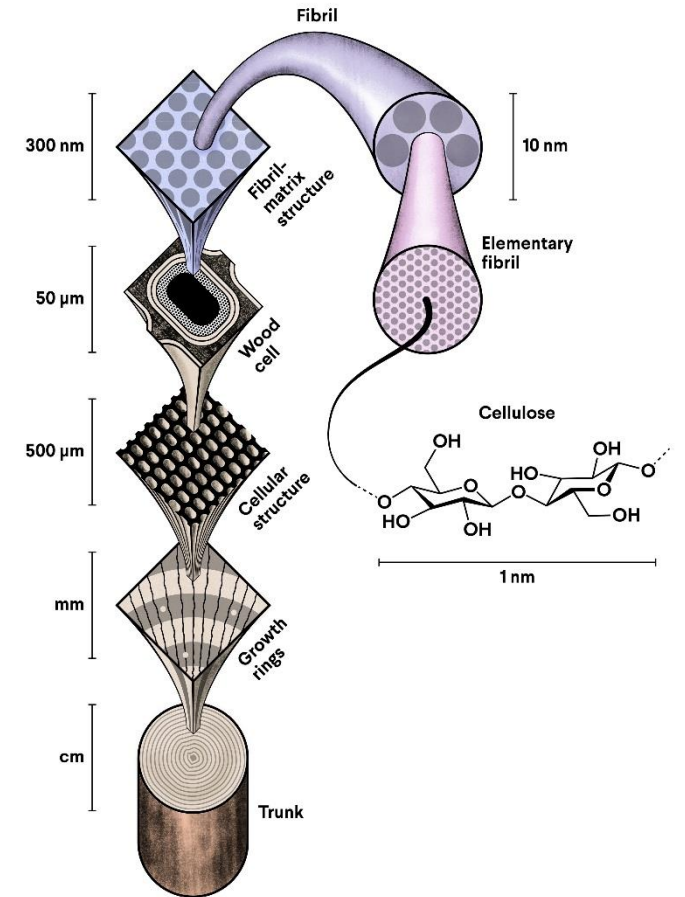
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Why Cellulose?

- Abundant – the most common natural polymer in the world
- Sustainable harvesting
- Replacement of fossil-based materials
 - Plastics
- Green chemistry
 - Production of chemicals from biobased materials rather than petrochemicals



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Electrical insulation components – motivation for research

- The market for electrical insulation components is B\$1.19 globally and M\$321 in Europe per annum.
- The components are made to different 3D shapes, such as snouts and yoke and edge collars according to their end use environment.
- Cellulose is a common raw material for the components but the state-of-the-art manufacturing method is in need of improvement



Power transformer unit. Photo: Urszula Czaplă/ABB.

NOVUM - Pilot line based on novel manufacturing technologies for cellulose-based electrical insulation components

- EU H2020 project (2017-2021) targeting to find novel and effective solutions for the production of electrical insulation components from cellulose-based materials.
- Project partners: VTT (FI, Coordinator), ABB (PL), ecoXPac (DK), Vertech (FR), 3DTech (FI), ABIS (PL), Exergy (UK), AGH University Science and Technology (PL), JRS (DE) and Ahlstrom-Munksjö (FR)
- The aim is to apply improved technology and material know-how with design thinking.
- To develop and demonstrate pilot concept based on novel technologies:
 - 3D printing
 - Foam forming
 - Thermoforming
- The manufacturing techniques are combined with cellulose material development to generate sustainable products from more efficient processes that fit the end-use requirements.



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NOVUM



Impact of NOVUM

- For electrical insulation components:
 - Process development: reduction in labour intensivity, increase in in energy efficiency and lower operating costs
 - Less waste generation
 - Implementation of design thinking in the research process, enabling the creation of user-centered products of higher customer value
 - Enabling integrated production approaches; Production of components with more sophisticated design and smaller production series by 3D printing, Production of less complicated structural components with larger production series by forming /moulding technologies.
- And Beyond:
 - Promoting novel bio-based materials for new applications
 - Versatile process technologies for producing cellulose-based products for various application areas; for example packaging, construction, biomedical.
 - How? Open technology platform (web-based)



VTT – beyond the obvious

Our vision

A brighter future is created through science-based innovations.

Our mission

Customers and society grow and renew through applied research.

Strategy

Impact through scientific and technological excellence.

Why partner with VTT?

1. Several strong scientific focus areas create a flexible platform for radically new technology and business development.
2. We have a proven track record: 9% of Fortune Global 500 companies are already our customers.
3. Several world-class research environments and solid IPR assets.
4. Our active network enables the utilisation of the best available know-how on a global scale.
5. Our skilled and motivated staff guarantees effective and reliable project execution.