



**Bigger could be better for
Tampere University, Finland**



There is a heady blend of the reassuringly well-established and the invigoratingly new at Finland's Tampere University.

On the one hand, the university itself was only created at the beginning of the year, merging as it does Tampere University of Technology and the University of Tampere. With its 20,000 students and 330 professors, this makes it the second largest university in the country.

On the other hand, the Paper Converting and Packaging Technology Research Group, which operates as part of the Faculty of Materials Science and Environmental Engineering, has been working in its specialist area for over 20 years. "We offer research and teaching on paper, paperboard and polymer processing, converting and packaging technology, wood-, fibre-, and plastics-based materials and products," says senior research fellow Johanna Lahti.

"R&D is focused on extrusion coating, laminating, dispersion coating, wet-, melt- and electrospinning and their applications," she adds. "Today's development challenges include high-barrier and thin coatings, materials from renewable resources and sustainable packaging materials." Much of the group's research centres on bio-based materials, including biopolymers, fibre-based and wood-based materials."

The research group is especially proud of its "unique" roll-to-roll (R2R) pilot line, offering tailored surface treatment and coating possibilities. But behind this sits a laboratory equipped with the full complement of modern analytical methods for characterising essential properties, from adhesion and barrier properties to sealability.



"We currently have eight people in our research group, with typically between 10 and 30 students following our courses in any given year," says Lahti.

On the packaging education side, she explains: "We have BSc, MSc and PhD courses within the Materials Science degree programme in the fields of, for example, polymers, converting and packaging."

Research topics include high-barrier technologies, whether for co-extruded coatings and films or paper and paperboard, biodegradable and bio-based coatings and materials and wood-based materials, such as lignin and cellulose, for different applications. But research also touches on areas as wide-ranging as: active & intelligent packaging; ways of adding surface functionality to films and fibre-based materials; and thin coatings and surface modifications applied using techniques including atomic layer deposition and atmospheric plasma deposition.



The research group has participated in EU projects such as PlasmaNice, NanoMend and ActinPak. It is currently involved in ongoing EU projects BioBarr, Eucaliva and LubISS, and in national projects including New Wood and BioÄly ('Biobased intelligent solutions').

Both within these types of collaborative project and outside them, co-operation with industry is important, whether with the paper and paperboard sectors, polymer manufacturers and converters or other areas of packaging. "For industry, there are several opportunities for co-operation, varying from academic theses to contract research (including trials and measurements), small and large-scale projects," says Lahti. MSc and PhD theses typically involve working with industry.

Recent developments have included investment in the pilot line to allow for the creation of cellulose coatings and films.

So far, says Lahti, the effects of the merger of the two universities has been largely administrative and organisational. "For students, it should provide more study options," she adds. "For research, we will perhaps see collaboration between research groups which have not collaborated in the past."



As a new IAPRI member, Tampere University is looking forward to embracing the opportunities that membership brings, including collaboration with other institutes, universities and companies. "We are interested in many different types of research project, but also offer our expertise in R2R piloting and analytics," says Lahti.

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