Editorial

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Let's talk tissue!

In this issue of *TAPPI Journal* (*TJ*), researchers Olejnik and Pelczynski of Lodz University of Technology in Poland and researcher Bloch of the University of Grenoble Alpes in France use an experimental device to measure the liquid absorption properties of tissue (p. 417). The device, called the eXtended liquid penetration analyzer (XLPA), was initially built at the Institute of Papermaking and Printing at the University of Lodz. Results from the study published here showed that the XLPA measurements were in good agreement with the ISO 12625:-8:2010 standard measurements. The researchers believe this method could ultimately help mills characterize the liquid absorption of their tissue in a better and faster manner.

For those interested in tissue, TissueCon 2019 offers a great opportunity to explore the latest research and technology in the field. TissueCon is the only peer-reviewed, non-commercial conference of its kind occurring in North America this year and will be held October 1-4 at the Gaylord Palms Resort and Convention Center in Orlando, FL. Some of the sessions of potential interest for *TJ* readers are discussed in the following sections.

Mechanics of tissue creping: Modeling and experiments—Srikantha Phani, University of British Columbia

This presentation explores the creping process and crepe structure quantification. Creping along the machine direction is modeled with a one-dimensional discrete mechanics model, taking into account the elasto-plastic properties of the web, forming patterns, and the fracture characteristics of adhesives. A discrete cohesive zone approach models the mixed-mode buckle-deamination process, and a virtual tensile test is performed to predict stretch and stiffness of the simulated tissue paper. Results show that stretch increases and stiffness decreases as the ratio between the creping amplitude and the wavelength increases. The simulated tensile stress-strain curve shows significant nonlinearity in qualitative agreement with experimental observations.

Comparison of wood and nonwood market pulps in tissue paper application—Tiago de Assis, North Carolina State University

A comparison of ten market pulps at laboratory scale using uncreped tissue handsheets was performed to study the performance of wood and nonwood pulps for tissue manufacturing, evaluate what fiber features are desired for a specific tissue property, and determine how nonwood pulps can be used to replace or complement wood pulps in tissue products. A characterization of the fiber morphology and handsheet properties was performed at different mechanical refining levels.

The results showed that the fiber morphology had a major impact on the tissue properties. Market pulps with a combination of long fibers, high coarseness, and low fines content provide superior bulk and water absorbency, while short fibers with thin cell walls and low fines content impart superior softness. Bleached bamboo soda pulp can replace hardwood and softwood pulps to provide both excellent water absorbency and strength. Bleached bamboo soda pulp can also replace northern bleached softwood kraft (NBSK) pulp to impart strength without sacrificing softness. Bleached and semi-bleached wheat straw soda pulps presented a similar combination of softness and strength as southern bleached hardwood kraft (SBHK) pulp. The wheat straw pulps can be used to replace deinked pulp (DIP) pulp to impart intermediate levels of water absorbency and strength.

Eucalyptus fibers vs. other hardwood fibers for tissue applications—Xuejun Zou, FPInnovations

Pulp fibers, particularly hardwood kraft fibers, are a major component of tissue manufacturing cost and also significantly impact tissue quality. Selection and processing of hardwood fibers to maximize their tissue making potential is increasingly important as tissue makers face high market pulp prices. This presentation covers the main fibers used in North American tissue and towel products, including analysis of samples collected from retail stores; morphology of various eucalyptus pulps (e.g., those from South America and Southern Europe) vs. various NBHK pulps (from Canada, USA, and Nordic countries). It examines eucalyptus vs. aspen results from a benchmarking comparison through pilot tissue trials, studying the synergy in tissue properties created by blending eucalyptus with aspen. The presentation also covers the importance of pulp selection, refining, and blending,

New opportunities to evaluate the hand feel (HF) potential of fiber resources—Marcel Prinz, Munich University of Applied Sciences

This paper describes the relationship between the fiber morphology of several market pulps and their softness potential. A laboratory procedure was developed to observe known influences of different pulp sources on softness on handsheets. To achieve a high reproducibility, the TSA from emtec was slightly adjusted and the handsheet making was adapted as necessary.

The investigation shows that expectations, such as the relationship between strength and softness and the differences between long and short fiber sources, can now be observed on handsheets. Furthermore, the fiber width distribution proved a very important morphological property regarding surface softness potential. This thesis offers a glimpse of how refining influences softness and which fiber sources might do so more decisively. With the developed procedure, a pulp producer could potentially develop products further without running an expensive costumer trial on a tissue machine.

A new paradigm for high strength-high softness (HS)2 tissue production—Lokendra Pal, North Carolina State University

One of the critical processes affecting tissue and towel properties is mechanical (refining) treatment. This work examines an innovative approach for producing high strength-high softness (HS)2 tissue products by using a high-shear homogenizer—the iFiber unit. Old corrugated container (OCC) pulp was mechanically treated using an iFiber homogenizer, double disc refiner (DDR), and a combination of iFiber and DDR in tandem. Handsheets were prepared from unrefined, iFiber homogenized, DDR refined, and DDR refined plus iFiber homogenized OCC pulp fibers.

The iFiber-homogenized OCC pulp handsheets showed better bulk, water absorbance, and strength properties without adversely affecting softness and drainage (freeness) relative to unrefined tissue sheets. In tandem with DDR refined pulp, iFiber handsheets showed higher water absorbance and improved softness without significantly decreasing bulk. The iFiber unit deflocculated the pulp stock through high-intensity homogenization, without significantly affecting fiber quality, such as fines generation. Further, iFiber homogenization intensity is controllable by speed and rotor type for tuning tissue properties.

For more details about these and other sessions, view the TissueCon 2019 program or contact TAPPI Tissue Division Manager Robert Dawson at rdawson@tappi.org or +1 770-209-7247.

For registration and other information, visit tissuecon.org or contact Robert. For every two registrations to TissueCon from one organization, the third registration receives 50% off, and those who sign up for the Tissue 101 course also receive a 50% discount. **TJ**