

TECHNICAL PAPER

Tissue: the technical challenge

In the intensely competitive tissue market, a successful pulp supplier has to have a clear vision of changing customer requirements. Softness remains critical, which is why Södra Cell is spending so much time on the issue.

Christer Fasth, Technical Product Manager for Tissue & Board - Södra Cell

As competition in the tissue market increases, Södra Cell's role as a major pulp supplier to the industry is to work tirelessly to improve the properties of its fibres. Tissue is a major growth area for Europe's largest market pulp supplier. Over the last 10 years, the proportion of Södra's pulp which goes into tissue applications has increased from 7% to 30% and one in four toilet rolls in Europe is now likely to contain pulp from Södra.

Supplying such an intensely competitive market means there is no room for complacency. Tissue producers are the most demanding of customers, expecting consistent optimum quality, energy efficiency and the latest environmental credentials as standard. Around 55% of Södra's pulp to the tissue sector is FSC certified and 25% PEFC.

SÖDRA IS CURRENTLY WORKING ON SEVERAL NEW PRODUCTS SPECIFICALLY FOR THE TISSUE MARKET WHICH WILL OFFER CUSTOMERS ENHANCED PERFORMANCE AND QUALITY. In the spring of 2012, it will start producing at least one upgraded softwood product to enhance both dry and wet strength for tissue mills.

Softness remains a crucial issue for tissue makers, says Christer Fasth, Södra's Technical Product Manager for Tissue & Board, which is why it's heavily in focus at the company's R&D department.

SHORT FIBRE PULP, SOURCED FROM HARDWOOD TREES (mainly eucalyptus pulp), is broadly accepted as the key source of softness in tissue, which explains why tissue makers have been at pains to increase the proportion of short fibre in their tissue recipes. Price comes into it, too – short fibre pulp tends to be cheaper per tonne. But long fibre, sourced from softwood, is essential for strength and runnability, both on the tissue machine and in converting. So if a tissue producer is boosting the short fibre content of its tissue, it had better make sure that the long fibre content which remains is of the best quality. Otherwise breaks on the converting line or customer complaints about a poor quality sheet will quickly outweigh the softness gains from the extra short fibre. The most common parameter when discussing tissue production is dry strength, which is affected by fibre choice and refining. Softwood imparts dry strength, but also improves tear strength properties, which is why it's important to use softwood within the furnish. Since using the right softwood is key, it's here that Södra is trying to find optimum solutions for tissue makers.

THE LENGTH OF A TREE'S FIBRES VARIES DRAMATICALLY ACCORDING TO ITS VARIETY AND SOURCE. In typical trees used at Södra mills, for example, the fibre length for spruce averages 1.5-5.0 mm, pine 1.0-4.5 mm, birch 0.3-1.7 mm and eucalyptus 0.3-1.5 mm. The wood that arrives at the mill gate and the subsequent pulp produced is inevitably subject to an element of natural variation – it is not 100 percent homogeneous. At all Södra mills, wood sorting is done in the wood yard and pulp production follows strict parameters for its three main pulp groups: Black, Blue and Green.

At least 10 different species of eucalyptus pulps are currently available, so tissue producers should try to find a favourite eucalyptus pulp. Södra's focus is mainly on softwood. Much of Södra's research into the optimum tissue furnish begins with choosing the right wood for the specific job. Pulp belonging to the products called Södra Black, for example, is a strong softwood kraft, with relatively short, slender, strong fibres averaging around 2.1 mm, while

Södra Blue has an average fibre length of 2.2-2.3 mm.

ONCE THE RIGHT WOOD HAS BEEN CHOSEN, EVERY STAGE OF THE PRODUCTION PROCESS HAS TO BE CAREFULLY CONTROLLED with the final product properties in mind. TCF bleached pulps have a higher fibre charge than ECF-bleached pulps, for example, because the ECF-bleaching removes a part of the charged groups in the hemicellulose, while TCF-bleaching actually introduces some charged groups. For unrefined fibres, the surface charge in general follows the fibre charge. When the pulps are refined, the surface charge increases. However, unique processes can also impart a high surface charge. One example of this is the product Södra Black R which uses a mixture of ECF and TCF bleaching. The last alkaline bleaching stage increases the charge of the pulp which is an important parameter when softwood pulp is used in kitchen towels requiring high wet strength. Higher-charge pulps react better with wet strength chemicals.

Refining has an adverse effect on softness so it is important to treat the fibres with care. Refining is unavoidable but all the parameters important to tissue producers are negatively affected by refining, including dewatering, bulk, absorption and bulk softness, so the key is minimum refining to achieve optimum strength, and this is a key issue for Södra's R&D department.

Södra already has some unique softwood pulps and will continue to develop these. To achieve maximum softness, use a high amount of eucalyptus in combination with the right easily-beaten softwood for high dry strength and good runnability. Expect even better results when Södra's new softwood pulp enters the market later this year. •