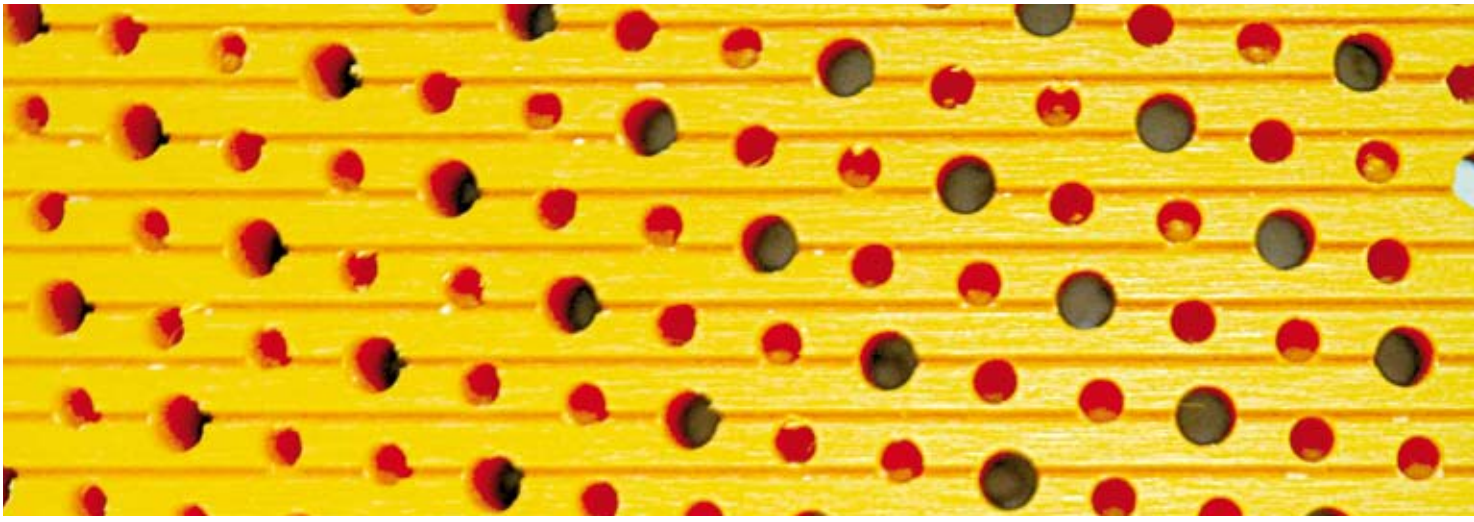
New polyurethane roll cover increases production and saves energy

SolarSoft – the magic word for perfect tissue

Rubber roll covers in tissue manufacturing are notorious for after hardening and heat development. SolarSoft, a polyurethane roll cover developed for tissue, minimizes these issues, while providing potential for energy savings and production gains.



Possible surface design of SolarSoft.

Due to material limitations, rubber roll covers are problematic in tissue manufacturing. One of the most common problems is after hardening of the rubber. Typically a rubber cover will after harden 20 to 40% over its life. This hardening changes the performance of the roll. Another unfavorable characteristic is heat generation due to rubber's dynamic properties. Heat generation results in excessive cover temperatures, which can reduce cover life or require internal water cooling of the roll.

Despite these limitations, rubber covers are still often used in the tissue industry. In North America, Voith's T-Master II runs on the largest machines – up to 7.6 m (300 in) wide, and on the fastest machine: 2050 m/min (6700 fpm). Hence Voith Paper is pursuing a two-part-strategy to meet the ever increasing demands of the tissue industry. On one hand, the current rubber roll covers will continue to be improved.

On the other, a new polyurethane roll cover has been developed especially for tissue. Polyurethane mitigates the hardening, heat generation, and wear resistance issues associated with rubber. Polyurethane also offers advantages in dewatering and reduced variability formerly unachievable with rubber. The result of this development effort is SolarSoft – its successes argue for itself:

Longer run periods – SCA in Ortmann, Austria

A SolarSoft cover has been installed in SCA Ortmann's PM 9 machine since October 2007. An inspection in September 2008 noted that the surface still looks nearly new after eleven months of operation. Historically, rubber covers at this mill had to be removed after eight months in operation.

No internal cooling – WEPA in Müschede, Germany

Stephan Frank, Plant Manager of WEPA Müschede stated the following: "Until now the pressure roll was covered with rubber covers, therefore water cooling was absolutely neces-

sary. Some time ago the water cooling failed and the rubber cover was destroyed within a few hours. The maintenance costs for the cooling were very high. Now SolarSoft has been in operation without cooling for several months. During the next planned downtime, the cooling will be permanently removed. This saves us time and money."

Rubber, being a weaker material is limited to a maximum open area of approx. 30%. The stronger polyurethane allows the maximum open area to increase over 40%. Polyurethane covers can also be grooved more effectively than rubber, which provides another way void volume can be increased to customize the cover. Increasing the surface open area and void volume provides opportunities to increase dewatering at the press. Increased dewatering has three potential advantages; production increases, reduced energy consumption, or potential to increase the use of recycled material. All of these opportunities reduce cost while minimizing the environmental impact of the operation.

Increase in production through speed increase

A standard rubber covered suction pressure roll with 19.8% open area was converted to SolarSoft with additional blind drilling (31.7% open area). This change immediately allowed a machine speed increase in excess of 100 m/min, using standard machine settings. The Mill Process Leader said, "This change looks to be a major move forward for this mill, giving us a potential increase in production up to 5 tons per day. The roll was changed from the standard rubber cover without changing anything else on the paper machine; we restarted without any problems and immediately saw a speed increase in excess of 100 m/min. We see no reason now, given some continued experience, why the spare roll cover should not be replaced with the same Voith Solar polyurethane cover."

Saving raw materials through optimized dewatering

Another example of a dewatering advantage is from a tissue mill in North America. Initial installation of SolarSoft achieved three production records because the cover dewatered better. Since then, the mill has been able to increase the recycled paper content considerably without significantly reducing the production rate. This is something that had been impossible with the previous rubber cover. The end result is significant raw material savings as well as an improved environmental impact.

Infobox:

SolarSoft Benefits:

- Better dewatering through increased variety of surface designs and excellent dynamic properties
- Better tissue quality through tailor made surface designs
- Longer lifetime of the cover through very good wear resistance
- Higher tissue quality through constant nip conditions during operation
- High level of operating safety and machine availability through outstanding strength and elasticity
- Optimized safety through minimizing the subsequent damages in particular injuries of individuals

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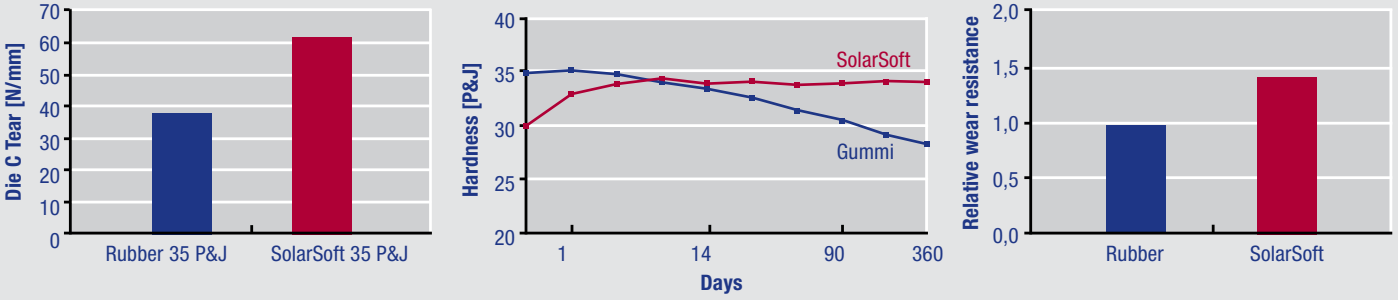

Tear strength *Hardness change* *Wear resistance*