

Greater value-added through improved cross-profile control

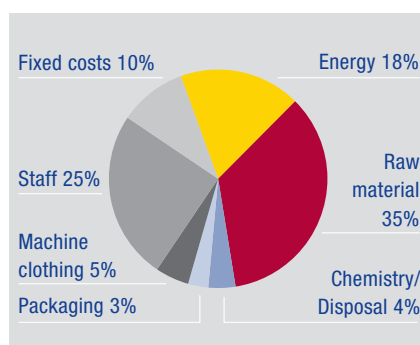
Everyone is talking about greater value-added these days, not only top managers. A recent international survey by PriceWaterhouse-Coopers among 17 paper industry leaders brought a clear verdict: the value-added chain must be further optimized. Voith Paper Automation aims in this connection to reach the point where paper machines automatically maintain optimal operation, thereby increasing value-added. The benefits of automation innovations are twofold: not only better paper quality, but also lower energy consumption.

In practise, optimizing value-added means finding the best compromise between maximum production output, minimum use of resources, and highest product quality. And that depends on how important each of these three parameters is for the customer concerned. Typically, more than 50 percent of mill operating costs are attributable to raw materials (35%) and energy (18%). So this is clearly where the most effective action can be taken, for example by reducing energy consumption and improving overall process cost-efficiency with automation systems.

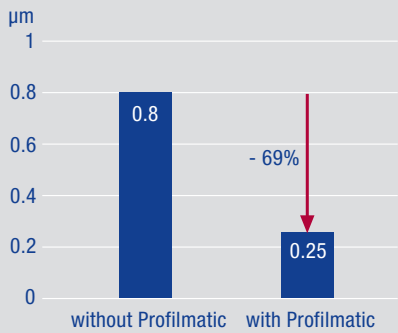
Voith Paper Automation systems cover all aspects of the papermaking process. In terms of customer benefit, this means that you can depend

on Voith Paper as an overall system supplier highly competent to upgrade your existing machinery with automation systems. Voith is increasingly approached in this connection for optimizing paper machines, increasing their speed or reducing their energy consumption.

One such solution offered by Voith Paper Automation is OnQ ModuleTherm, controlled by OnQ Profilmatic software. Thanks to this technology the sheet thickness can be kept much more constant, with significant energy savings at the same time. A good example is PM 18 in Ruzomberok/Slovakia, producing copying paper for Mondi SCP. Voith Paper Automation used OnQ ModuleTherm here to reduce the thickness devia-



Typical operating costs in the paper industry: more than 50% attributable to energy and raw materials costs



Ruzomberok PM 18 – Thickness cross-profile readings on the calender

Basis weight	80 g/m ²
Mean sheet thickness	104 µm
Line force	28-34 N/mm
PM speed	1,250-1,400 m/min

Thanks to OnQ Profilmatic, the thickness cross-profile (2-sigma value) on PM 18 in Ruzomberok was significantly improved

tion, already low at 0.8 µm (2-sigma value), by 69 percent to 0.25 µm – about one hundredth the diameter of a human hair.

OnQ ModuleTherm directs an air jet, which can be separately adjusted for each control zone, on to the calender roll surface. The different surface temperatures in the control zones

cause different radial expansions of the roll. These result in calender nip line force variations that influence the sheet thickness profile. Another way of varying the calender nip line force over the web width is by Nipcorect roll, whose hydrostatic support elements exert different pressures in each zone along the roll. Both OnQ ModuleTherm and the Nipcorect roll are controlled by OnQ Profilmatic software. By coordinating individual actuator adjustments in each zone, this software enables any desired thickness profile to be realized.

Each time an OnQ ModuleTherm is commissioned, Voith focuses on energy savings. To this purpose, a new solution has been developed where the actuator energy consumption is measured and automatically reduced

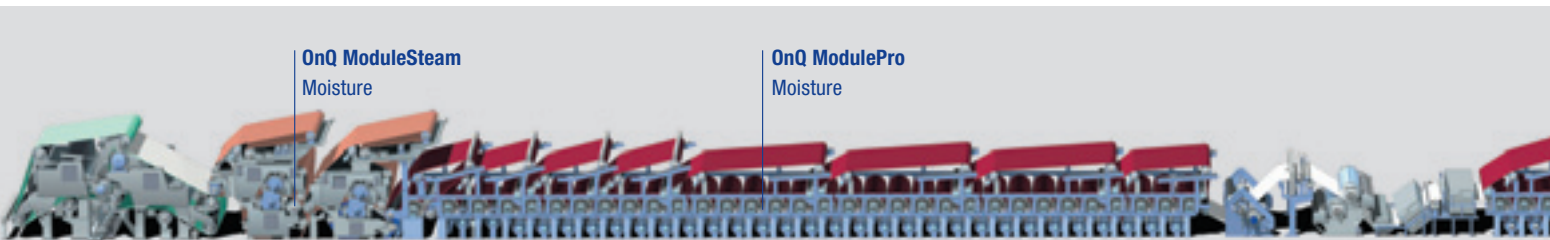
slowly until the programmed quality requirements are reached within certain tolerances. Using this strategy, energy consumption during the commissioning of a hardnip calender (in Ruzomberok) was reduced by about 70 kW. The resultant annual savings amount to about 600 MWh or 40,000 Euro.

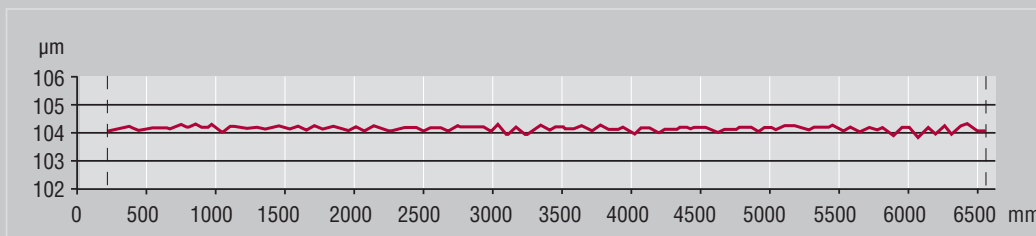
This control strategy – that optimizes not only paper sheet quality but also profitability in terms of value-added – also applies to the OnQ Module-Steam blow box regulation system. Whether on DuoCentri presses, Tandem NipcoFlex or Single NipcoFlex – the innovative OnQ ModuleSteam control system guarantees a high dry content after the press. OnQ Module-Steam also optimizes the moisture cross-profile after the press for opti-

The efficient actuator control by OnQ Profilmatic software enabled improved paper quality, and lower energy consumption right down the line

OnQ ModuleSteam
Moisture

OnQ ModulePro
Moisture





Using OnQ ModuleTherm and Nipcorect roll, both controlled by OnQ Profilmatic software, cross-profile thickness deviations were greatly reduced (Ruzomberok)

mal transfer to the dryer section. Together with the new control strategy, OnQ ModuleSteam automatically reaches the best compromise between optimal dry content and optimal cross-profile. And a higher dryness after the press means significantly less energy consumption for drying, which increases value-added.

Another way of increasing value-added by improving cross-profile control is the OnQ ModulePro nozzle moisturizer system. This ensures an ideal humidity cross-profile using state-of-the-art nozzles and valves, and is likewise regulated by OnQ Profilmatic control software. An OnQ ModulePro regulating valve with stepless high-precision adjustment moisturizes the web only as far as necessary to attain the required humidity cross-profile.

The optimized moisturizing system saves energy afterwards in the dryer section, and thanks to the better paper quality, the web run is also improved so that fewer breaks occur. OnQ ModulePro is, therefore, another important tool for optimizing value-added in papermaking. After installing OnQ ModulePro on Rheinpapier Hürth PM 1 newsprint machine in Germany, the quality improvement was nearly 80 percent – on a paper machine that was particularly demanding due to its high operating speeds.

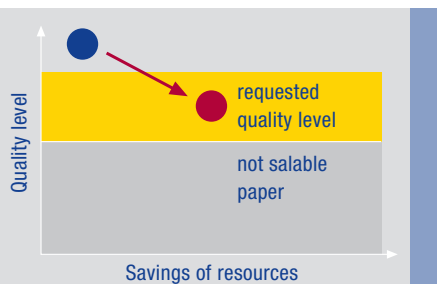
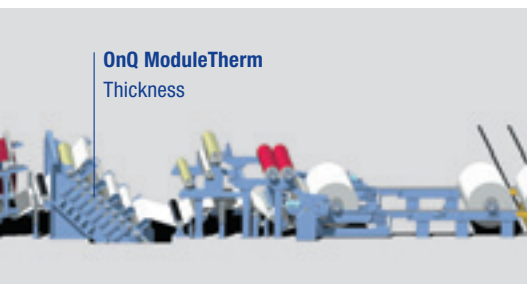
As shown by these examples, with new automation concepts existing machines can now be optimized to realize their full value-added potential. These concepts not only optimize paper quality, but also significantly

reduce operating costs. An optimal compromise can thus be reached automatically between maximum production output, minimal resources consumption, and highest product quality. This can save mill owners 30,000 to 200,000 Euro per CD control system each year, without requiring any further production line investments.

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Energy consumption is reduced until the requested quality level is reached. This means greater profitability in terms of value-added