

*V<sup>Plus</sup> Steam Joint and the V<sup>Plus</sup> ThermoBars ensure optimal dryer cylinder performance.*

**Value+ Steam Technology Optimization Package**

## **New steam technology concept improves drying process**

**A large portion of energy cost in the paper industry is incurred when drying the paper. Reducing energy consumption in the dryer section is therefore one of the most pressing tasks to increase the efficiency of paper production. The new Value+ concept makes savings of up to 20% possible, depending on the system.**

**Steam technology – the challenge**

- Energy savings ↗
- Production costs ↘
- Environment +

**Value+ Steam Technology Optimization Package optimizes the drying process**

*Energy savings up to 20% with Value+.*

In the past the operating speed of many paper machines was increased in order to increase production. In the process, the steam technology was oftentimes not adapted to the new conditions. As a result, the specific steam consumption often increased, that is, the ratio of the number of tons of paper produced and the required quantity of steam increased and was therefore less efficient (Fig. 1).

As a holistically-minded process supplier, Voith Paper takes comprehensive consideration of all aspects involved with the paper drying process. Using this knowledge, we develop custom solutions as part of the Value+ Steam Technology Optimization Package (Fig. 2). The following V<sup>plus</sup> Components make it possible to save energy, thus increasing the efficiency of the production process.

**Optimizing the steam and condensate system**

In order to modernize the system, first an analysis is performed on-site. This is mostly to locate weaknesses in the drying process, heat transfer of

steam to the wet paper, the drying cylinder dewatering and system instrumentation.

Here, the drying is not purely a heat conductivity problem but rather is affected by other factors such as pocket air humidity and movement in the ambient air and pressure. Based on this all-encompassing analysis, the optimum web drying is calculated and developed. The key element for designing new as well as modernized systems is the process calculation program which gives the plan of action a solid founding. The potential reflux of capital consists mainly of saved steam and/or the increased production output.

Saving steam can, for example, be achieved by reducing quantities of exhaust steam and better arranging dryer groups among each other. Further potential can also be found in steam-heated auxiliary consumers. Their consumption can be reduced through a proper recycling of heat. Depending on the system, savings of up to 20% is possible. An increase in the production output can always be

achieved where the drying process is the bottleneck in the paper production process. The drying output is determined by the average difference between the temperature of the roll surfaces and the paper web temperature. This can be increased by raising the steam pressure, making constructional alterations or using condensate turbulence generator bars, which can increase the drying output and resulting production speed at 1,000 m/min by approximately 20%.

In contrast, insufficient evaporation can still reduce the speed despite high heating. Saturated ambient air or a poor air exchange can interfere with the material transmission. The process assessment, combined with a broad range of experience and dependable hardware, makes it possible to design custom solutions that can reach amortization in less than a year.

**V<sup>plus</sup> Steam Joints with stationary siphons**

In many current drying cylinders, the dewatering is performed by steam joints with rotating siphons. To ensure

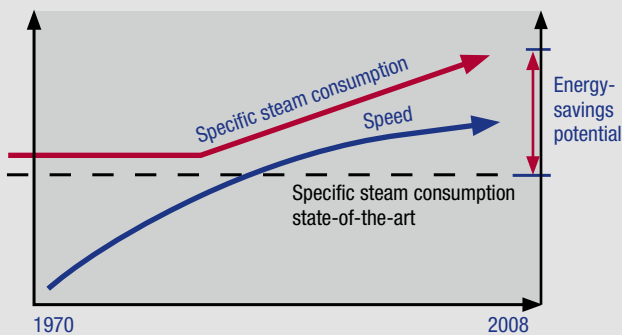


Fig. 1: Energy savings potential in steam technology.

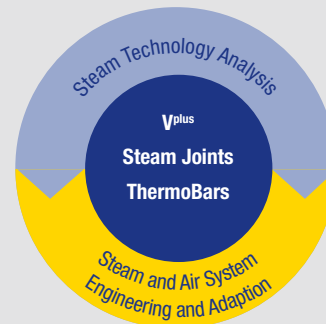


Fig. 2: Value+ Steam Technology Optimization Package – tailor-made customer solutions.

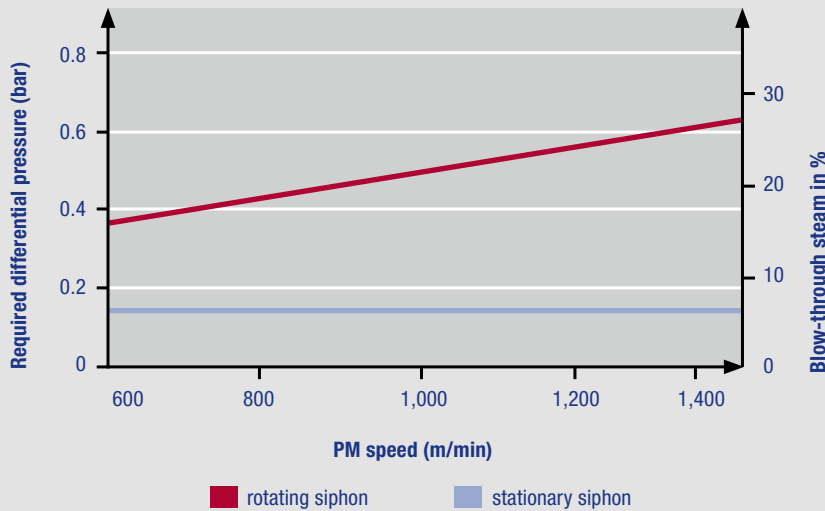


Fig. 3: Stationary siphons with low differential pressure and reduced blow-through steam provide for reliable dewatering and optimal energy requirements across the entire range of speeds.

a reliable dewatering of the drying cylinder, the differential pressure must be continuously increased with a rising PM speed. At the same time, the blow-through steam increases (Fig. 3).

Low cylinder pressures and increased production speeds often even have the result that the cylinders cannot be dewatered. As a result of the accompanying decline of the heat transfer, the drying capacity can drop massively.

Steam joints with stationary siphons from Voith offer an economical alternative. They make for reliable dewatering at the lowest differential pressure. In addition, the blow-through steam does not intensify with increasing speed and remains at the lowest level when the siphon diameter is optimized. Voith steam joints are

maintenance-friendly thanks to their light, compact design. The necessary replacement parts can be delivered quickly and inexpensively ex-warehouse.

**V<sup>plus</sup> ThermoBars**

For production speeds greater than 500 m/min, the condensate forms a laminar ring in the drying cylinder, which reduces the relative heat transfer of the steam to the interior wall of the cylinder.

ThermoBars break up this ring by creating turbulences to create an increase in the heat transfer and drying capacity. This can increase the production speed and output.

The custom planning of ThermoBar installations in selected drying cylinders creates a precise improvement

in the heat transfer while improving the moisture profile at the same time.

Mini ThermoBars for the edge region of the cylinder have a positive effect on moist edge strips of the paper web.

Increasing energy costs reduce the efficiency of the paper industry and demand action.

V<sup>plus</sup> components help to reduce energy costs, thereby securing competitive advantages.

**Infobox:**

- Can be used regardless of paper type, for example, with graphics papers, cardboard, packing and tissue paper
- For more information on Value+, please visit <http://www.valueplus.voithpaper.com>.

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