

## **Light-Weight Board Concept a ROI based project approach**

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There are only a few important overriding goals in paper production. One of the most important is to sell the desired product with the highest profit and using the least amount of resources.

Various measures are suitable to get closer to this goal. And for each subject area different solutions are available. This can lead to a high degree of complexity when selecting and deciding on the right solution concept. Furthermore, there is the risk that the solution path is predetermined by the provider and is not necessarily tailored to all important needs and aspects of the customer.

With our parent company Voith and its extensive know how, BTG has created a solution concept that focuses on the economic aspect and not only on products.

The Liner Board Concept clearly targets an ROI of less than 6 to a maximum of 9 months. Due to the high benefit results in Euro per ton of paper, it is even highly interesting for smaller production units.

The approach presented is based on many years of experience and expertise as well as the successful implementation of numerous projects in practice in the field of process optimization, especially in stock preparation, wet end, and surface application. This involves using a unique combination of technical, technological knowledge and skills with innovative hardware and smart digital tools.

The concept thus provides a customer-specific package of solutions along the value chain of paper production that forms the basis for a resource- and cost-efficient production.

### **Voith/BTG Solutions**

Voith/BTG are well known and appreciated in the paper industry. The combination of expert knowledge gathered over many years together with innovative new developments and intelligent solutions and tools in the field of digitalization represents a unique and comprehensive portfolio.

For the solution concept presented in the following, only the outstanding expertise and solutions in data management, advanced process control and process and application knowledge are mentioned.

## Voith/BTG – A unique combination that creates value

### Out-Standing Expertise and Profound Knowledge

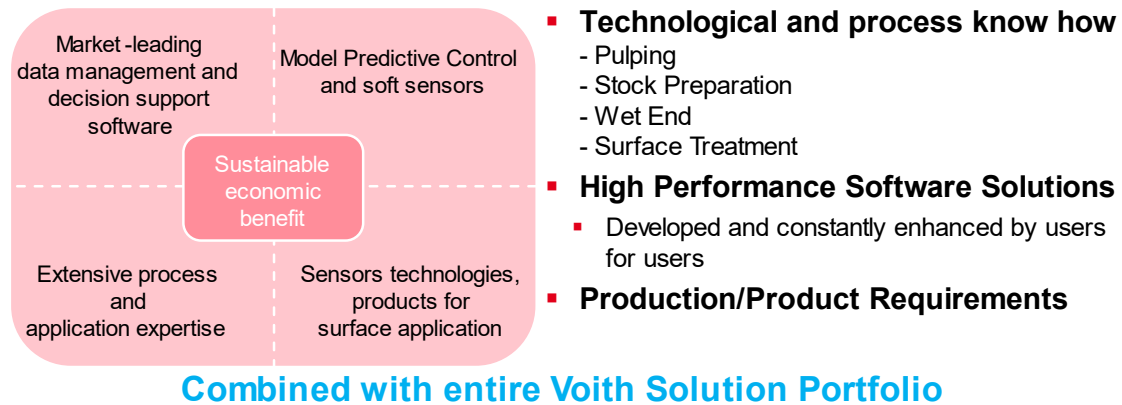


Figure 1: Unique combination that creates value

On the one hand, BTG has deep technical and technological knowledge and understanding in the field of stock preparation, wet end, and surface application, on the other hand, the knowledge of the challenges and premises regarding paper production, product and converters' requirements. In addition, intensive cooperation with the production management and direct support of the operators in the use of the tools and various functions is a very important factor for us. We collect information and data in order to make them useful for decisions and actions to support you to achieve and secure the desired quality.

### The Liner Board Concept

Voith/BTG's range of solutions for the pulp and paper industry already has a remarkable scope and is correspondingly comprehensive (see below).

## Voith/BTG Solutions



Figure 2: Voith/BTG solutions

When the solutions of several vendors are added, the total offering can already become very complex, even for defined subject areas. This can lead to different solution concepts being offered for one and the same subject area, with the blueprint often being provided by one vendor. Which does not always lead to the best result for the customer.

In addition, "solution products" are often offered in the paper industry that completely or largely neglect the fundamental optimization of the basis. This would not be a bad thing if the foundation is already in good condition and remains so. But we have found in numerous analyses (> 30 in the last years) that 95% of both established and newly built or rebuilt plants have significant deficiencies. Based on these repeated findings and the outcomes from the resulting solutions, we derived the need for our Liner Board concept. Based on established and proven solutions and tools with high benefit potential, we have put one goal in its center:

**ROI less than 6 months to max. 9 months**, as shown in the following illustration.

## Liner Board Concept in brief

**Saving Potential 5 €/t to 15 €/t**  
**Investment 800 k€ to 1.300 k€**

- Cost of Strength
- Product Quality
- Surface Starch
- Yield
- OEE



- Water Management
  - CO2-Foot Print
  - Sustainability
  - Energy

\*calculated as total Savings/total Investment

Figure 3: Liner Board Concept

With this specific approach, we consider the increasingly difficult and volatile framework conditions for manufacturing companies. Due to the high savings potential, this is also a very attractive way for comparatively smaller production units to become more resource efficient.

Even if the economic goals and results of the Liner Board Concept are clearly defined, the proven methods, tools, and solutions (described in more detail later) are of course selected and implemented on a customer-specific basis. In this context, the primary task, the intention, and the purpose are shown in the figure below.

## We find and eliminate the weak points in your foundation

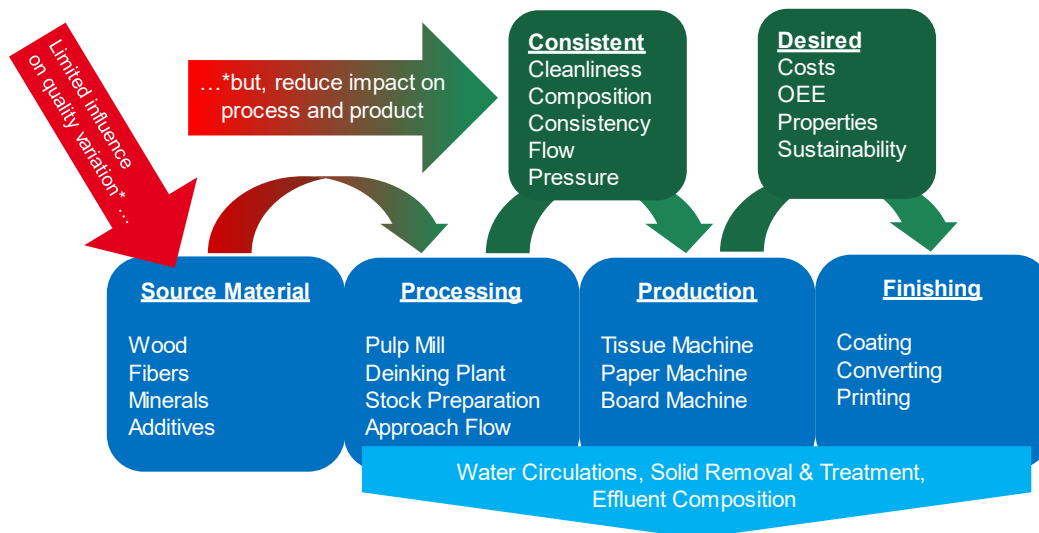


Figure 4: Where are the weak points in the foundation

The basic idea of this approach is as follows: The mills usually have only a limited influence on the quality variations of the raw materials used. This is of course especially true for recovered paper. On the one hand, the influence of these fluctuations must be reduced as far as possible, on the other hand, additional induced fluctuations in stock preparation and wet end must be avoided. This is the only way to ensure the best conditions for production on the paper machine and further optimization measures, including digitalization.

Therefore, it is essential that the foundation is in sufficiently good condition, as mentioned in the next figure.

## This is how process improvement goes

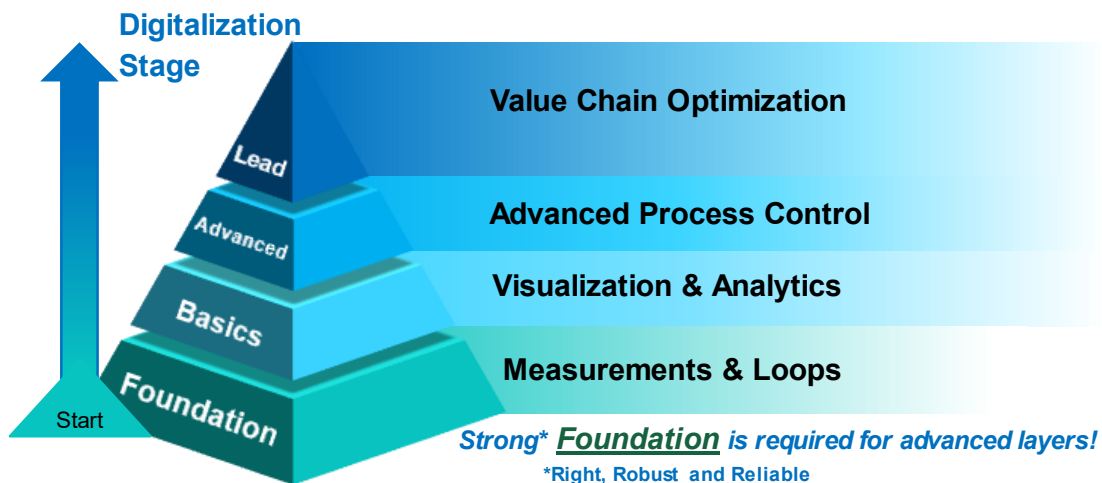


Figure 5: How process improvement goes

In many projects, we have experienced that a strong foundation represents the necessary basis for further tools, measures, solutions, and digitalization. In over 95% of the cases, we found that the foundation was in a significantly poor condition. Therefore, we have made it one of our core tasks to develop methods and tools that incorporate our expertise, identify the weak points, determine their impact, define the solutions, and provide a cost-benefit analysis.

The entire process from the first step to the success verification and project completion is shown in the next figure.

## BTG project schedule

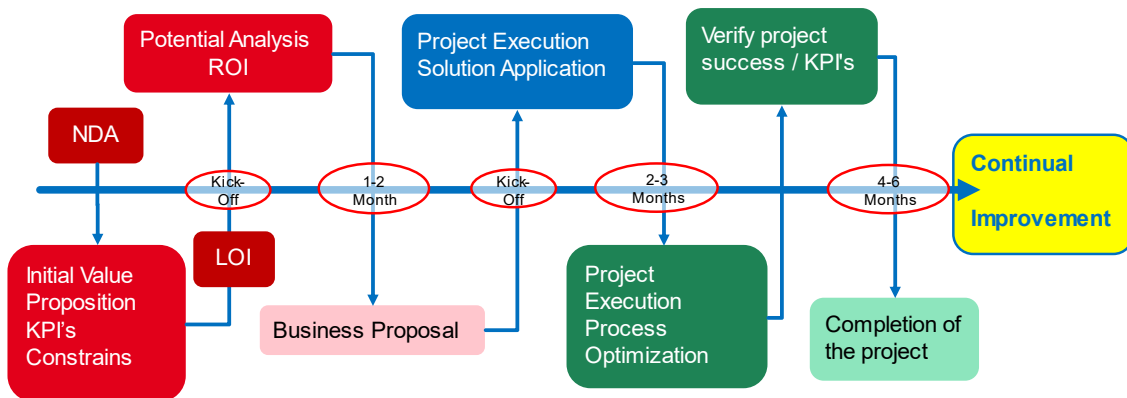


Figure 6: Project schedule

The course that is decisive for the success of the project is set in the first steps. It should be emphasized that at the beginning, in addition to the project goals, all important framework conditions and restrictions are discussed and evaluated. If all project participants do not openly communicate, there is a high risk that the effort involved in project implementation will increase significantly and the overall success will be jeopardized. We therefore take considerable effort for the measures up to the business proposal, which will pay off in terms of the number of successfully completed projects.

In the following we would like to briefly examine a few case studies:

## Use Cases

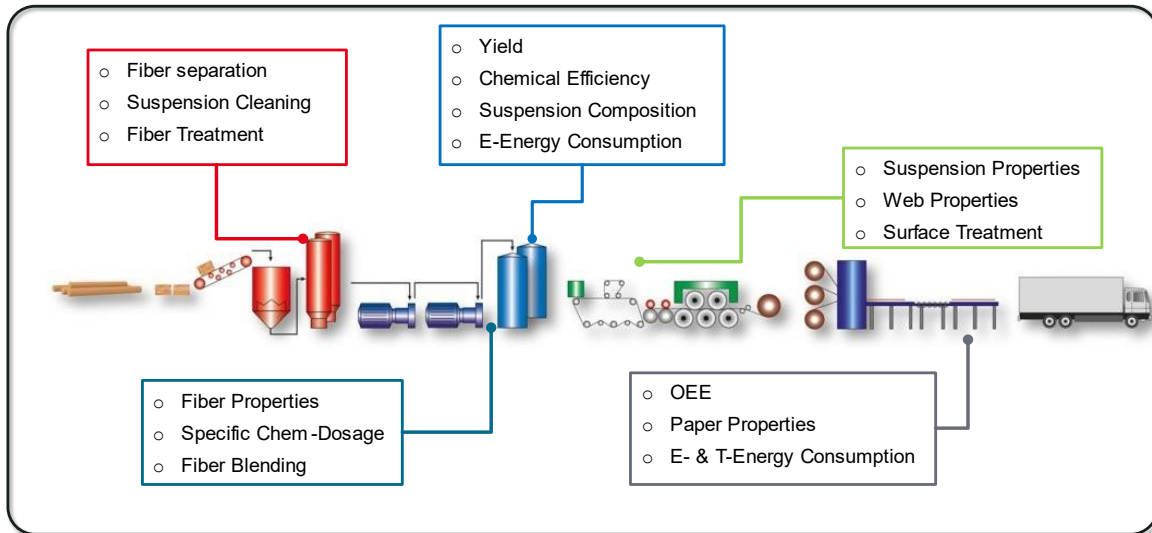


Figure 7: Use cases

The figure above showcases the areas and the main aspects that will make up the savings of 5 to 15 €/t. Typically the scope, tasks and objectives of the Liner Board Concept consist of these individual modules.

Few examples:

- Yield**  
 Due to an improved OCC yield in the pulper to headbox area, we were able to achieve savings of 1 up to 6 €/t (OCC). Improvements were made in screening, in the water circuits, and in the pulp and base paper composition.
- Electrical Energy**  
 Based on optimization of the mass flow from pulper to headbox, savings of 10 to 30 kWh/t were achieved. In addition, further savings have been achieved in fiber refining.
- Chemicals**  
 Chemical savings of 0.7 to 2.2 €/t were achieved here by means of suitable measures. In addition, there are further cost reductions due to improved product effectiveness.
- OEE**  
 In part, the improvement in OEE is a consequence of the measures and activities already planned. The increase in OEE is often the initial reason for optimization in stock preparation and wet end. In general, it can be stated that OEE improvements of around 0.4 to 2% per production year have been achieved.

However, there is another aspect without which everything achieved is not worth much. This aspect is



sustainability.

## Sustainability of benefits is key

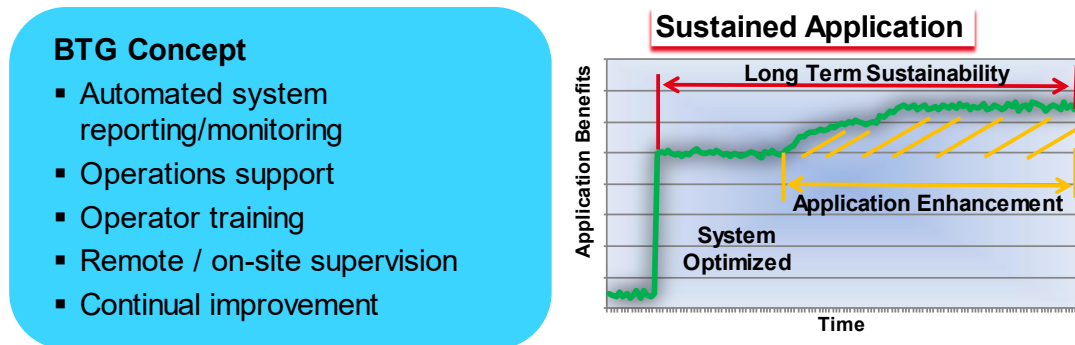


Figure 8: Sustainability of benefits is key

Therefore, we have also developed specific tools, methods, and measures to ensure the sustainability of project results. Of course, it is important to measure the project result objectively. Decisive factors are the

- effort before project definition
- involvement and consideration input from mill management to operator level
- timely and automated presentation of deviations from the target
- correspondingly powerful technological and technical support

These are only a few aspects to be considered.

### Summary Liner Board Concept

- Based on established and proven solutions and tools with high benefit potential
- Clear target of an ROI less than 6 to a maximum of 9 months.
- Assists our customers to sell their desired products with the highest profit and the least use of resources
- Provides a customer-specific package of solutions along the value chain of paper production

- Main focus is process optimization, especially in stock preparation, wet end and surface application.
- Highly interesting even for smaller production units.
- Sustainability of the benefits is key