



One of 40 gap formers for board and packaging papers running worldwide - DuoFormer Base at Jass Schwarza.

How to make a successful concept even better

DuoFormer Base II – a step towards the future

Increasingly lighter basis weights, higher machine speeds and ever decreasing raw material quality – these are the three challenges many papermakers are facing today. To cope with this situation, the new DuoFormer Base gapformer in its second generation has been developed.

Putting the more than 40 Voith Paper gap formers used in the board and packaging industry all over the world together, results in an impressive amount of operating experience.

The benefits of the gap former concept have been proven in a large number of production lines. Several records with regard to speed and

specific output have been reached. Now, why should anyone want to change this tried and tested concept?

The answer is quite simple: Changes in the market require an adaptation to the present situation. The share of recycled paper used as raw material will even increase in the future, result-

ing in more contaminants and consequently poorer dewatering properties of the fibres.

Apart from that, the demand for lighter papers without raising the speed leads to a reduction in tonnage. A closer look at the gap formers sold so far reveals a clear trend: Ever increasing machine speeds and decreasing

basis weights. In order to follow this trend the target of the further development was to adapt the concept.

Ambitious development goals

Various customer suggestions resulted in the corners of further development. Besides higher drainage capacity, operating stability, clean design and the reduction of the investment costs were improved. Other attributes like process stability even with varying raw material quality, excellent technological values over a wide speed range, reproducibility of technological parameters and easy grade changes were equally ensured. The operating window also needed to meet present and future demands for light basis weights.

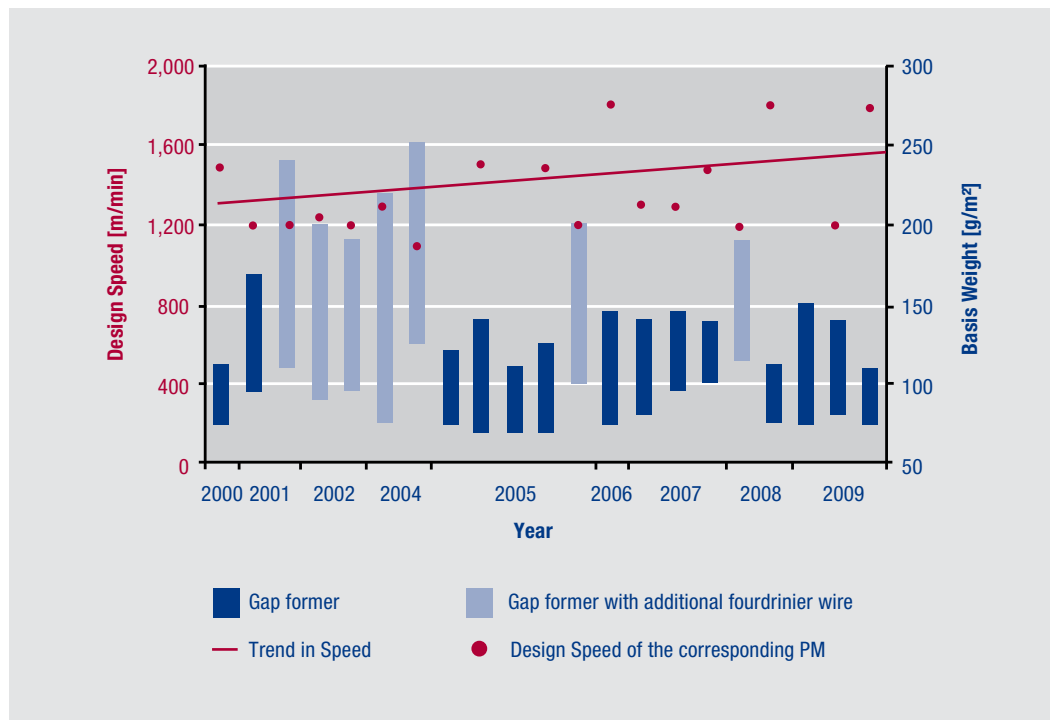
The Voith Paper engineers focused on optimal accessibility during operation, simple maintenance and excellent clean design. The clean design features specific advantages: Lower build-up of mist by showers, for instance, and less deposits. Therefore, operational disturbances caused by web breaks can be reduced.

Great importance has been attached to a high-grade integration of the automation system. The proven OnControl process control system based on the Siemens PCS-7 platform was adapted to satisfy the special requirements of the paper industry. The entire visual display system is process-oriented and quickly gives the operator a current overview at any time. The subordinate machine logic is tai-

lored to the technological needs. During normal operation, start/stop sequences allow easy and quick handling. While doing service and maintenance work, the focus is on occupational and machine safety.

The control loops are easy to operate thanks to the visual display system, offering different views for the analysis and diagnosis of failures and alarms. With OnC LoopSpy, the operator has a very powerful tool, helping him to diagnose and visualize online the cause of any alarm or failed switching operation directly on the screen, thus considerably increasing control transparency.

The settings of the former have significant influence on paper properties.



Fourdrinier paper machines with low operating speed and high basis weight range are decreasing. The trend clearly goes towards higher speeds and lower basis weight - the domain of the gap former.

With OnV VirtualSensors it is possible to predict parameters like strength (for example SCTCD). This enables an optimization of the former settings at an early stage.

Secrets of dewatering

As is commonly known, the major part of drainage takes place in the inlet area. Therefore, forming roll and jet channel request special attention.

Decisive concept changes in the twin-wire area are a higher forming roll wrap angle, a shortened blade section, reduced vacuum zones, as well as a modified water flow.

Practical experiences have shown that a larger wrap angle on the EvoFlow F forming roll has a positive ef-

fect on drainage capacity. Increased roll drainage positively influences the strength values required for packaging papers. The blade section has been shortened, thereby ensuring good formation and gentle handling of the moist web.

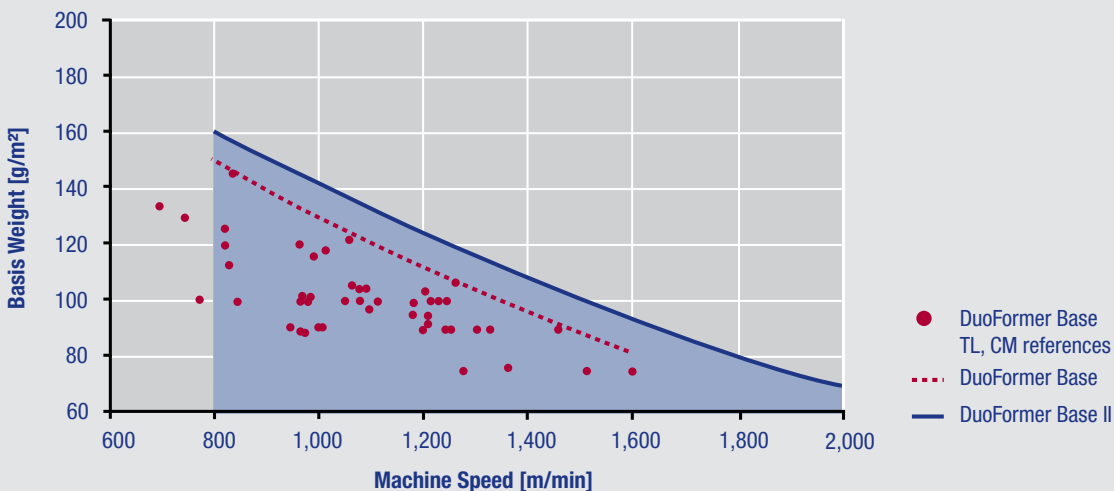
The drainage at the forming roll is mainly determined by four parameters: the wire tension; the open volume of the roll shell, the suction zone length, as well as the vacuum level in the suction zone. EvoFlow F with its shrunk-on wire and honeycomb design, is the market leader when it comes to void volume due to the highest open volume available. For better wearing protection, the forming roll can be coated with CeraForm ceramics. In this case, the shrunk-on wire is not required.

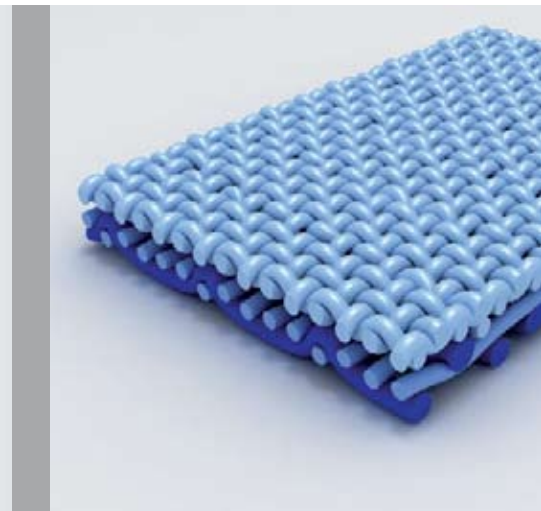
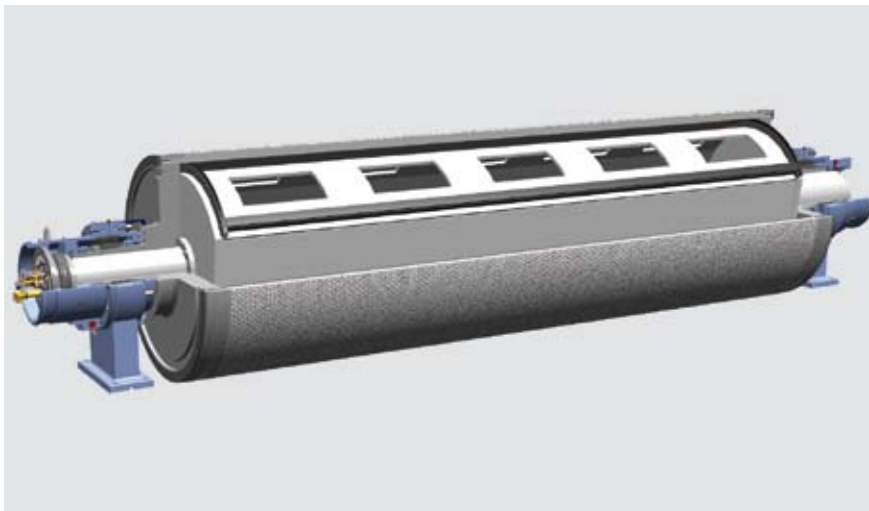
Due to an optimized web guidance combined with good web run stability, a lower design height of the former was the result.

HiVac instead of suction couch roll

The high-vacuum box (HiVac) has been successfully used in graphic paper machines for many years. Adapting it for packaging papers was therefore nothing but a logical consequence. For light and medium-weight paper grades, the HiVac is used as the last dewatering element instead of a suction couch roll. It improves the drainage capacity, eliminates the maintenance required for a suction roll, reduces investment costs and provides an energy saving potential for

The use of the DuoFormer Base II permits up to 200 m/min higher speeds at the same basis weights.





Forming roll EvoFlow F and forming wire MultiForm – concentrated Voith Paper know-how for the new DuoFormer Base II.

vacuum depending on the box's length.

The HiVac can increase dryness after the wire section by a higher percentage compared to the solution using a suction couch roll. The amount of water in the web before the pick-up roll is lowered by more than 10%, thus reducing the water absorption in the pick-up felt.

Understanding the process leads to success

To get the most out of the gap former, a thorough understanding of the whole process is required. In particular the wires play an important role, and requirements are diverse: High initial drainage capacity, excellent fiber support, smooth and trouble-free operation and runnability, optimal wire stability, as well as long service lives, just to mention a few.

Choosing the right forming wire application starts with understanding the customers needs with regard to paper quality, drainage capacity and runnability. A balance is achieved by selecting a wire design suited to the requirements. Using abrasion-resistant materials helps to ensure maximum wire lifetime while maintaining a high paper quality.

With MultiForm, Voith Paper Fabrics developed a complete product portfolio to meet the customers' requirements.

The results of constant product-related development of forming wires were quite logically integrated into the further development of the DuoFormer Base II.

Each detail in the new concept perfectly fits together.

Excellent dewatering conditions (dewatering shoe, water guidance),

the good clean design as well as the bundling of know-how in the areas of forming roll and wire design are self-evident. Optimally matching components are required to achieve superior paper quality and machine performance – no matter what challenges the future may hold.

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