

## Progressive cross profile control software OnQ Profilmatic



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### For outstanding results in cross profile control

The OnQ Profilmatic cross profile control software includes numerous progressive control strategies that are characterized by a high reaction speed and deliver reliable flat cross profiles.

OnQ Profilmatic sets new standards for the quality of the cross profiles through use of statistical process and quality control technologies (SPC & SQC). The shape of the profiles is quickly and precisely determined through the use of unfiltered, high-resolution profile measurements. The ability to determine the portion of random noise in the measurements, and thus to identify the actual cross profile variation, makes the traditional filtering method for processing measurements superfluous.

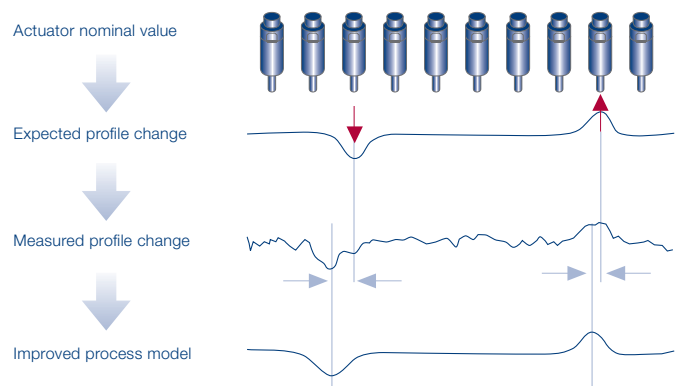
Continuous, dynamic profile mapping allows an exact local correlation of the control zones of the actuators to the profile measurement values. Faulty correlations due to running or shrinkage of the paper web during grade changes are thus prevented. The adaptive behavior of OnQ Profilmatic allows optimization of the control that is very easy to carry out and thus eliminates the time-consuming tuning procedures that were previously necessary with a complex multitude of grades.

The OnQ Profilmatic controls, the OnQ actuator systems and the Voith OnQ quality control system are perfectly coordinated with one another and thus achieve the best measurement and control qualities. Of course, OnQ Profilmatic can also communicate with other compatible quality control measurement systems via standard and open interfaces and can control them with actuator systems.

### Benefits

- + unique, continuous, dynamic mapping eliminates errors with local correlation and achieves the best control results
- + the adaptive behavior of OnQ Profilmatic quickly actualizes flat profiles
- + automatic detection of edge actuators
- + optimal control for individual quality parameters that are influenced by several cross profile systems
- + strategy for different weighting of a control magnitude, with inclusion of a secondary quality variable to control the primary quality variables
- + quick start-up after a web break; basic configuration of cross profile control in less than an hour

### Auto-mapping Example: headbox





**Progressive strategy for cross profile control**

The OnQ Profilmatic cross profile control software consists of numerous progressive control strategies that deliver outstanding results.

They include:

- quick implementation and rugged design of the control
- easy optimization
- flexible application modules
- minimal maintenance required
- adaptive behavior of many technology programs

**Quick profile data analysis**

The OnQ Profilmatic software analyzes unfiltered high-resolution profile data as the readings come in from the quality control system. A special statistical analysis process differentiates random noise in the process from the actual cross profile deviation and longitudinal profile separation. Since a special filtering method is used, the shape of the profile deviation can be determined quickly and exactly.

The OnQ quality control system with its low level of measurement noise allows quick control with optimal profile quality.

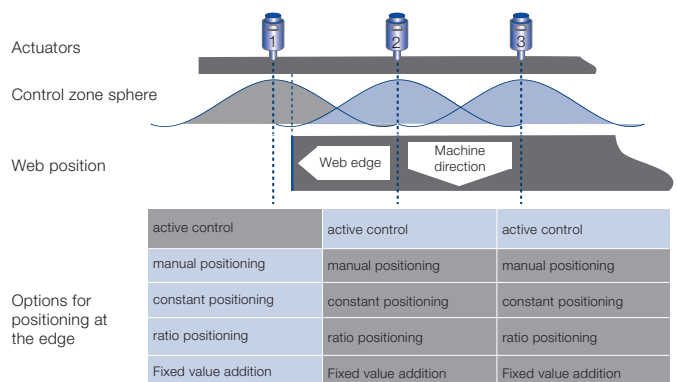
**Dynamic profile mapping**

A dynamic online mapping algorithm continuously determines and corrects mapping deviations between the measured profile data and the actuator zones. The dynamic mapping automatically compensates for various influence widths of control zones, non-linear shrinkage and wandering of the paper web in cross direction. Thus no offline mapping procedure is required, avoiding additional service costs and automatically ensuring optimal quality.

The OnQ Profilmatic dynamic mapping algorithm exactly determines the deviations in the measurement profile and does not need a bump test after start-up. It reliably maps them to the corresponding control zone.

The OnQ Profilmatic control knows the models of the influence parameters for all cross profile actuators and optimizes the control point ranges for the actuator, based on the mechanical conditions and decoupling of influences in adjacent zones. This leads to the smallest possible adjustment steps of adjacent actuators, protects the profiling equipment from damage due to faulty actuator deflections and ensures the highest paper quality.

**Installation position in the tissue machine**





### Automatic control tuning

The OnQ Profilmatic cross profile control includes an integrated, automatic, adaptive control algorithm. This control dynamically optimizes the control parameters on the basis of process change.

This is a general control strategy that does not require different grade-dependent basic settings. The outlay for operation is thus low and there are reliably consistent cross profiles of high quality for the entire grade range.

Intuitive procedures for basic setting of the control reduce the start-up time and in general do not require any grade-specific optimization or maintenance.

### The high-tech solution for your paper machine

Quality and production advantages can be achieved by using a multiple-actuator control strategy.

OnQ Profilmatic can break down an individual quality profile into short-wave and long-wave components. The actuator system with the smaller zone division eliminates the short-wave portions and the actuator system with the larger zone division eliminates the long-wave portions. These portions are transmitted to each cross profile control system by means of feed-forward control.

### Control of two paper qualities

An actuator system can control two paper qualities at the same time. For example, it may be desirable to take into account a moisture profile weighted in the control of the basis weight. The calculation can be done either for the entire profile or just for certain zones that are defined in advance.

### Dealing with edge actuators

The following options are available to OnQ Profilmatic outside the paper web for dealing with actuators:

- automatic detection
- manual positioning
- positioning on a constant value
- relative positioning with the last actuator still on the paper web
- positioning on the value of the last actuator on the web

### Minimum or maximum average value

Depending on the application, the actuator adjustment ranges can be operated at the minimum or maximum value. This applies to steam boxes so as to achieve maximum production and to nozzle moisturizers so that there is as little remoistening as possible. For these cases, various basic settings are undertaken with OnQ Profilmatic.

### Accelerated control

The OnQ Profilmatic thickness cross profile control has unique capabilities for quality improvements at maximum reaction speed.

### OnQ ModuleTherm and OnQ ModuleNip

OnQ ModuleTherm with OnQ Profilmatic includes a model-based algorithm for temperature control. The performance of the corresponding zone is first set at maximum strength and then it cools down to the actual set point, so that the desired set point is achieved more quickly. The desired nominal profile is quickly achieved again after a web break. The OnQ ModuleNip cross profile control with the associated OnQ Profilmatic cross software is suitable for quick reactions to thickness fluctuation in the profile of the paper.



### Outstanding profiles with actuators from Voith

A perfectly regulated cross profile is indispensable for optimal paper quality. The OnQuality actuator series from Voith provides a multitude of reliable controls for various areas of application.

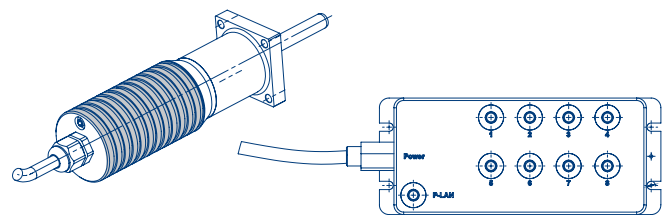
#### OnQ ModuleJet

The OnQ ModuleJet actuator system provides for a uniformly regulated basis weight cross profile already at the headbox and thus ensures that even the highest requirements for paper quality are met.

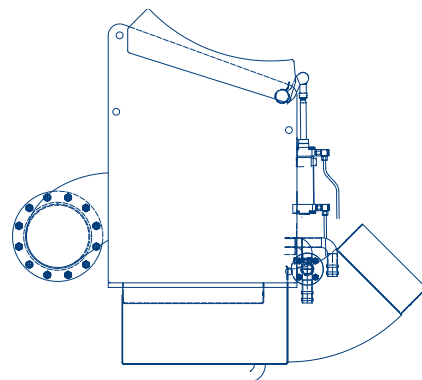
#### OnQ ModulePro

The OnQ ModulePro nozzle moisturizer with moisture cross profile control delivers optimal moisturizing results due to its outstanding spray quality and exact spray quantity monitoring. Depending on the installation location, it can be used for moisture cross profile control, curl reduction or remoistening.

#### OnQ ModuleJet drawing



#### OnQ ModulePro drawing





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