ADVANCED AUTOMATION SYSTEM

BQC BOARD QUALITY COCKPIT

steinemann

Surface quality from
start to finish.

TSQ TOTAL SURFACE QUALITY

Total Surface Quality is the goal of every solution we develop for our customers. Every single project imposes unique demands on the machines, abrasives, processing steps and services.
These elements must harmonize perfectly to achieve perfect sanding results that live up to your, and our, high standards of «Total Surface Quality».

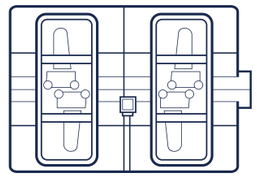
1.Q PROCESSES

The configuration of a sanding process determines whether you reach your quality, performance and efficiency targets. To ensure it does, Steinemann offers not only sanding seminars, but also an innovative process control system called the BQC (Board Quality Cockpit). It provides the machine operator with relevant information on the ongoing processes that helps him produce panels of consistently high quality every time.

2.Q SERVICES

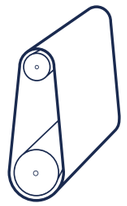
Steinemann's range of services is geared to maintaining the high performance and uptime availability of all machines currently in operation. We support our customers by offering customized, on-site maintenance and operator training classes, online remote servicing and numerous training videos. Our network of service technicians provides on-site service all over the world.

3.Q MACHINES



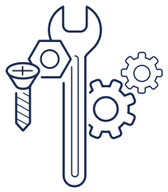
Thanks to innovative technologies, Steinemann wide belt sanders have been setting new standards in quality for over 50 years. Whether the focus is on factors such as sanding results, durability, machine availability, safety, cost-efficiency, or on materials such as particle boards, MDF, plywood, OSB boards or laminates, Steinemann has the right sanding technology for every need.

4.Q ABRASIVES



The perfect interplay between abrasives and machines is a key factor in quality panel production. That's why we don't leave anything to chance and manufacture segmented belts ourselves. By doing so, we ensure both the machine and material are a perfect match for a given production process.

5.Q PARTS



Even the best machine is not immune to wear over the long run. To prevent a worn part from causing extended downtime unnecessarily, Steinemann offers an exceptionally well-organized spare parts and repair service with short turnaround times and extensive warranty services.

BQC – the process control system for a fully integrated, automated sanding process.

With Board Quality Cockpit (BQC), Steinemann has achieved yet another milestone in its pursuit of Total Surface Quality.

The combination of the satos family and BQC represents a giant step towards our ultimate goal: the fully automated sanding process. Interfaces to internal and external systems ensure the straightforward and comprehensive collection of all relevant data.
Data from the entire sanding process is analyzed in BQC to derive recommendations for action that result in improved quality and efficiency, plus cost savings.

BQC ERP
Data exchange and/or reporting for jobs, products, and recipes
+ Improved control, higher quality
+ Optimized process integration

BQC BASIC
Process control system with visualization, trends, and monitoring
+ Alarm/message handling
+ Optimum recommendations for action

BQC HANDLING
Interface to the handling system
+ Accurate reporting
+ Cost transparency

BQC EXT-THICK
Interface to external thickness measurement
+ Constant panel thickness plus recommendations for action

BQC INT-THICK
Interface to internal thickness measurement
+ Optimized sanding distribution and reduced belt wear

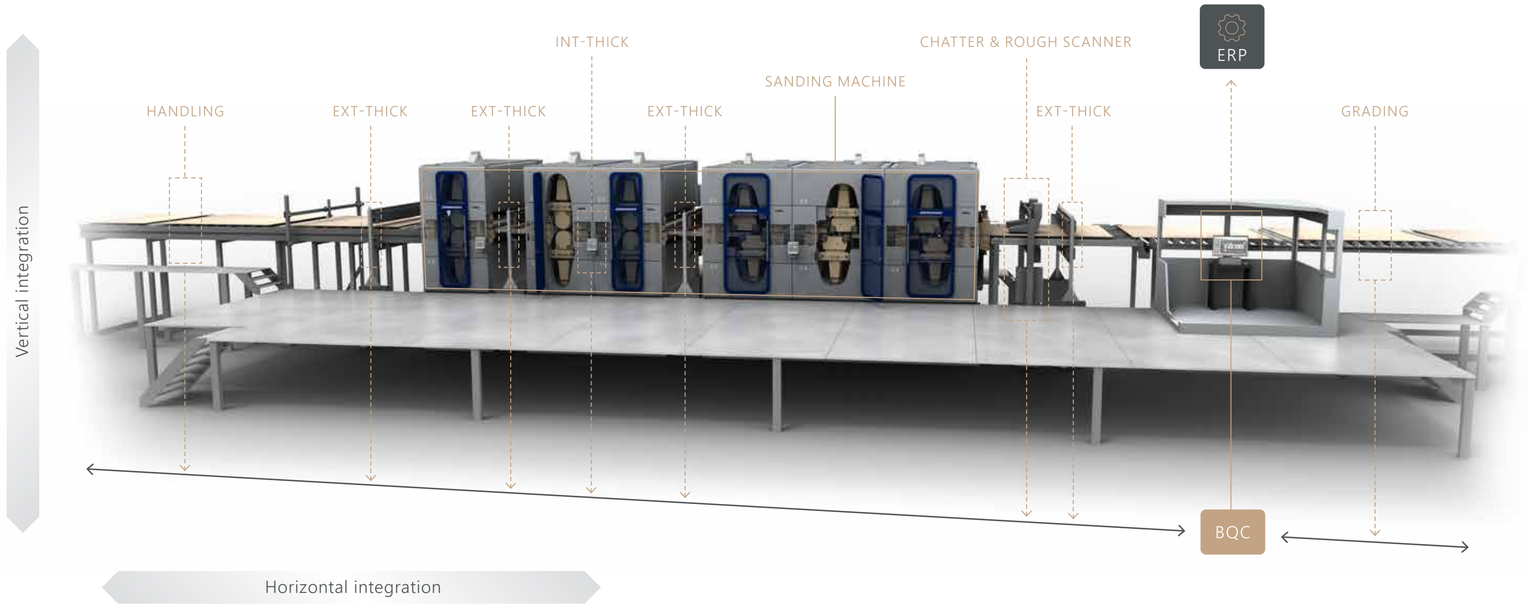
BQC ROUGH
Automated roughness detection
+ Reproducible board quality
+ Process stability

BQC CHATTER
Automated chatter mark detection
+ Reproducible board quality
+ Process stability

Integration of the entire sanding line.

The interlinking of all of the sanding line units required offers a high level of process transparency.

The horizontal integration involves connecting selected finishing line participants with BQC: BQC then gathers all of the data to provide real-time monitoring of the sanding process. Potential benefits increase as additional units are interconnected with BQC.
As one example, an interface to thickness measurement permits monitoring of the optimum sanding machine settings based on the actual thickness of the panel before, in, and after the sanding machine.



Benefits and potential cost savings.

Process parameter	BQC Package	Potential	Reasons	Cost savings*
Availability	BASIC PACKAGE	Up to 0.5 % higher machine availability	Fewer belt changes Fewer unplaned stops Higher feeding speed	780 m^2 more a day
Energy consumption	BASIC PACKAGE	Up to 5 % less energy consumption	Optimized distribution of sanding load on all sanding units	1,290 € per year
Belt consumption	Total Thickness Control (K)	5-8 % less belt consumption	Due to online calculated stock removal per head and grit size	8,000 € per year
B-Quality	Total Thickness Control (K)	B-Quality reduced by up to 80 % due to format change	Automated machine pre-setting	50,000 € per year
Conclusion			**Total cost savings per year** **Greater capacity**	**59,290 €** **3000 m^3**

* Electricity cost of €0.15 per kW, belt consumption ≈ 1,250 belts per year, production volume of 600,000 $^{m^2}/_{year}$

Use and functions of individual BQC modules.

BQC BASIC

BQC offers a range of functionality, depending on the modules selected. BQC Basic offers connectivity to the sanding machine itself, which already offers a number of advantages. Other data points needed must then be entered by hand (such as values for panel thickness).

Calculation function	• Calculates stock removal distribution per head with exact setpoints for machine height and the positions of contact drum and sanding platens
Check function	• All setpoints calculated – such as power consumption, machine height, contact drum positions, grit sequence, etc. – are checked in real time
Trends and reporting	• All BQC data points can be displayed as trend and comparison charts • Reporting functions provide a quick summary of machine availability • Data points for customer-specific reporting can also be provided
Administration function	• User management • Product management • Sanding belt management • Sanding platen management • Job management

BQC ADDITIONAL MODULES

The additional modules fill in the steps needed to achieve automation. An interface to the handling system avoids any need for operators to make entries by hand in this system, for example. And ERP connectivity enables automated machine pre-setting in the event of a format change.

BQC HANDLING (interface to handling system)	• Calculates production time remaining • Checks that the necessary number of panels have been sanded to A-Quality • Production and recipe data written from BQC to handling system –> no manual input required from operators
BQC INT-THICK (interface to internal thickness measurement)	• Checks that sanding distribution is within calibration sanding tolerances • Readjusts calibration heads in the event of continued deviations from setpoint • Checks parallelism of panels
BQC EXT-THICK (interface to external thickness measurement)	• Checks thickness of unsanded panels against setpoint. Readjusts machine configuration in the event of continued deviations from setpoint. • Checks thickness of sanded panels for deviation from setpoint and issues operating instructions as needed to obtain target panel thickness • Writes production and recipe data from BQC to thickness measurement control unit –> no manual input required from operators
BQC ERP (interface to ERP system)	• Product and job information sourced directly from ERP –> automated machine setting based on job information • Production data is provided for company-internal reporting • Communication possible between press control systems and BQC

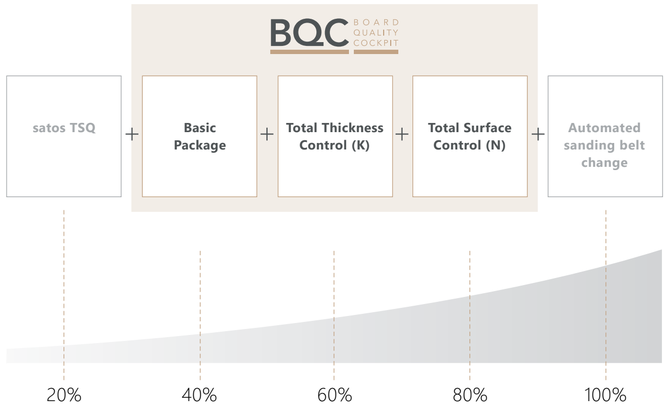
A clear overview ensures excellent process transparency.

All of the setpoints for the sanding machine are calculated and displayed individually on the "height adjustment" screen. The adjustment value depends on the grit sequence, the substrate, the panel surface density, the actual thickness of the unsanded panel, and the target thickness of the sanded panel. Values can be written to the sanding machine PLC automatically (depending on package selected).

Integration with an ERP system (or a press control system) enables the automated selection of jobs and recipes. A sanding recipe is attached to each job, which enables the job to then be linked with all of the information relevant for the sanding lines (layers, belt consumption, sanding allowance, stop time reporting, etc.).

Level of automation with different BQC packages.

The sanding process can be almost fully automated by selecting appropriate add-on modules. The Basic Package (BQC-BASIC + ERP) includes automated machine setting following a format change.
The Total Thickness Control (K) package (BQC-BASIC, ERP, INT-THICK, EXT-THICK, HANDLING) offers a fully automated calibration process.
Last but not least, the Total Surface Control (N) package (BQC-BASIC, ERP, INT-THICK, EXT-THICK, HANDLING, CHATTER, ROUGH) enables full automation of the fine sanding process.



PACKAGES IN DETAIL

Basic Package

- Automated machine pre-setting
- Recommendations for action

- BQC BASIC
- BQC ERP
- BQC HANDLING

–> Reduced costs for setup and operation

Total Thickness Control (K)

- Automated calibration process
- Uniform panel thickness and parallelism

- BQC INT-THICK
- BQC EXT-THICK

–>Closed-loop K-heads

Total Surface Control (N)

- Automated fine sanding process
- Uniform surface quality

- BQC CHATTER & ROUGH

–> Closed-loop N-heads

HEADQUARTER

Steinemann Technology AG
Schoretshuebstrasse 24
POB 461
9015 St Gallen
Switzerland

SUBSIDIARIES

Steinemann Technology Asia SDN BHD
Steinemann (Shanghai) Machinery Co. Ltd.
Steinemann Technology USA Inc.
ООО Штайнеманн Технолоджи АГ

CONTACT

Tel. +41 71 313 51 51
www.steinemann.com

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