BERNINA
made to create

QUALITY STANDARDS
SAFELY AND EFFICIENTLY
IMPLEMENTED

Image: BERNINA

BERNINA sewing machines from Steckborn on the southern shore of Lake Constance have a reputation like Switzerland itself: Exclusive, reliable and unwavering. This good reputation is due in no small part to the extensive quality assurance measures that BERNINA has implemented with the help of the BCT Inspector software, among other things.

BCT

BERNINA can look back on over 125 years of history. In 1890, Karl Friedrich Gegauf founded an embroidery shop and a mechanical workshop to manufacture his self-developed monogram embroidery machines in Steckborn on the Swiss shore of Lake Constance. In 1893, Gegauf invented the hemstitch sewing machine. In 1932, his son Fritz developed the first household sewing machine and marketed it under the BERNINA brand. The company has been constantly developing sewing machine technology ever since, culminating in the fully automatic and computer-controlled machines of today.

BERNINA is now run by the fourth generation of the founding family and employs around 1200 people worldwide. The headquarters in Steckborn is home - among many other areas - to the entire Development, Strategic Procurement and Strategic Quality Assurance departments. The top of the line sewing machines and the longarm machines for quilting

are manufactured in Steckborn. The rest of the production is now located at BERNINA's own plant in Thailand. Production and assembly at both sites are equipped to a high technical standard and manufacture and assemble to Swiss quality standards for export to over 60 countries.

The design and manufacture of the machines follow the motto 'Turning creative ideas into technical reality'. BERNINA sees itself as a quality market leader and pays particular attention to the stitch quality and robustness of its machines. Accordingly, processes are constantly optimized in the production facilities, aligned according to lean principles, and best practices are exchanged between the plants.

"In the Corona crisis, our sewing machines are more popular than ever," says Olaf Pforte, head of quality management at BERNINA. "People are more at home and discovering sewing as a hobby. To meet the steadily increasing demand for BERNINA machines

in recent years, while at the same time ensuring that the high-quality requirements for the products are met, we recently invested in ten new CNC machining centers at our factory in Thailand, among other things. This enables us to manufacture even more key components efficiently and to a high standard of quality."

"*BCT Inspector appealed to me immediately because it offered a solution to our problem with continuous ballooning of features across revision levels.*"

Olaf Pforte,
Leader Quality Management,
BERNINA

Image: BERNINA
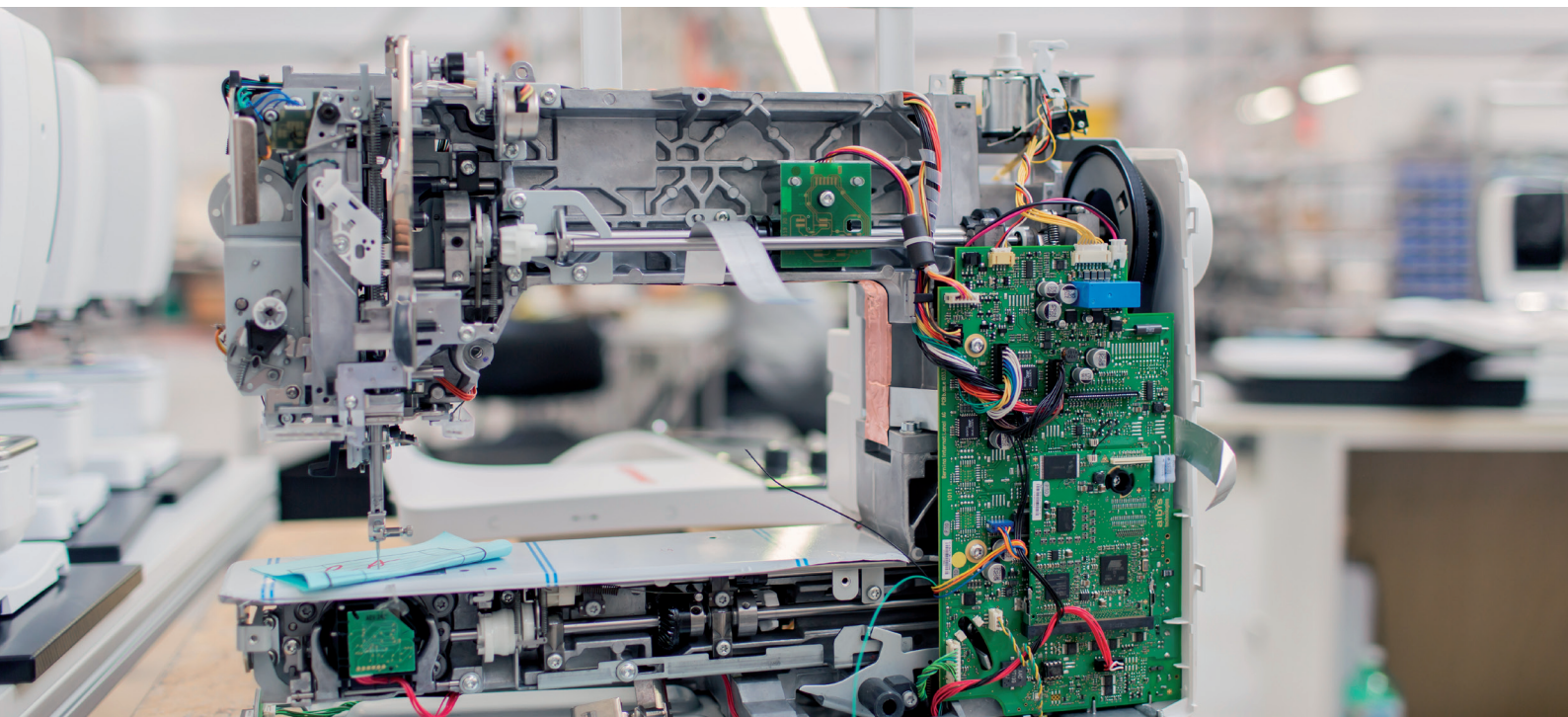
When Olaf Pforte joined BERNINA in 2017, two independent quality assurance systems were in operation in Steckborn and Thailand. Olaf Pforte looks back: "It quickly became clear to me that I had to merge these two QA systems into one system due to the close integration of the Steckborn and Thailand divisions. Together with my Thai colleague, we specified a specification for a

software generates customer-specific reports and initial sample inspection reports as well as change reports at the push of a button."

"I immediately liked BCT Inspector because it offered a solution to our problem with continuous ballooning of characteristics across revision levels," recalls Pforte. When 'ballooning' the drawing, the relevant characteristics are

problem for the planned statistical evaluation of the quality data (across revision levels), because inspection results from different characteristics are then stored with the same characteristic number in the quality databases," explains Olaf Pforte. "This distorts any quality evaluation."

In Solid Edge, the ballooning numbers are located on a layer

Gap closed between design, production,

and quality department

cross-site CAQ system at the end of 2017. Clear and consistent feature identification across revision levels was an elementary requirement of the specifications." Since the CAD system Solid Edge and the PLM system Teamcenter have been in use at BERNINA for many years, the inclusion of CAQ software from Siemens in the market research was obvious. Through Siemens, Olaf Pforte got to know BCT and its graphical inspection software BCT Inspector.

Martin Anliker, Business Development Manager at BCT, describes the software: "BCT Inspector extracts inspection characteristics from CAD models and drawings and integrates them into Teamcenter. The software detects changes in drawings and models and displays them in tabular or graphical form. The characteristics are updated accordingly. In addition, the

given a (characteristic) number. If the drawing was changed and characteristics deleted or views moved in the process, it was no longer guaranteed that the characteristics retained their originally assigned numbers in the new drawing. This was/is a

of the drawing but are internally linked to the respective feature. The feature balloons are managed by BCT Inspector in Solid Edge. Hereby BCT Inspector establishes the consistent use of characteristic numbers across revision levels, blocks characteristic numbers for characteristics that are no longer needed and assigns new characteristic numbers for new characteristics. Only in this way is a

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Many advantages due to automatic

ballooning

statistical evaluation of inspection results across revision levels possible and meaningful.

With BCT Inspector the characteristic numbers can be assigned automatically, and the software recognizes almost all characteristics in the Solid Edge drawings automatically, "form and position tolerances are reliably recognized and ballooned automatically. It becomes problematic when several characteristics appear as text in a paragraph or when dimensions are not defined correctly," says inspection planner Stefan Jehle, describing his experience with the system. "We have to pay a little more attention to this in the design. Currently, we are working with the

design department to supplement and specify the design guidelines in order to get closer to our goal of 'automatically ballooning 90 percent of the relevant characteristics' step by step."

"Automated creation of the balloons and associated documentation has a number of benefits. For one thing, we have time savings. For example, the templates for recording the initial sample inspection reports are automatically created by BCT Inspector and the nominal values and tolerances are entered. Previously, these were always entered manually. This allows us to eliminate transmission errors and speed up the entire process," Olaf Pforte lists. "We also manage

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Manuel Ried,
System Administrator,
BERNINA

to provide our initial sample documents to the purchasing department in time for the inquiry of the purchased parts. This enables the supplier to use our characteristic numbers in his inspection plans and inspection documentation, which in turn makes it easier for both parties to assign measurement results to characteristics and compare them in the event of discrepancies. Since, in addition to initial sample inspection report templates, we also provide the supplier with our incoming goods inspection plans, the supplier knows right from the start which characteristics are functionally relevant for BERNINA and what he has to pay particular attention to in his manufacturing process. This transparency increases the quality level of the purchased parts right from the start."

Manuel Ried, PLM System Administrator at BERNINA, recalls, "The collaboration with BCT was very efficient, we were able to quickly implement the integration of BCT Inspector into our Teamcenter installation in 2020 and go live with the CAQ solution in Steckborn in early 2021. In the next step, the solution will then also be rolled out in Thailand, which will give us further advantages - then the characteristics will be consistent across the entire company and all the way to the suppliers."

Manuel Ried reports on the implementation phase: "It turned out that the BCT interfaces are very flexible, so they can be adapted well. Thus, we were also able to connect our rather inflexible CAQ system. Now the inspection characteristics are automatically transferred to the CAQ system and supplemented there with the required inspection equipment. This way, inspections can be automated."

Stefan Jehle adds: "I first had to familiarize myself with the new process after receiving training from BCT, but now everything works perfectly. Currently, we are training the designers so that the Solid Edge drawings are generated in such a way that as much as possible is ballooned automatically, and we are working through the legacy issues." Olaf Pforte adds, "Each year, we inspect about 1,300 different series products in incoming goods. We are currently re-ballooning all the associated drawings. This is an immense amount of time, both for us and for our suppliers. In the end, however, we will all be rewarded because of the stringent numbering and the reduced potential sources of error."

Oliver Kauder, Senior Application Consultant at BCT, who accompanied the project at BERNINA, recalls: "Thanks to the professional administration at BERNINA, the integration of the software into Teamcenter and CAD was quickly possible. The connection to a third-party CAQ system was solved via neutral interfaces in workflows. Thus, the gap between design, production and quality department was closed quickly and efficiently."

"With BCT Inspector, we are taking a big step forward," says Olaf Pforte in conclusion. "The implementation went smoothly thanks to BCT's competent support, and we were able to optimize our feature numbering. That's worth a lot and helps us to implement BERNINA's quality standards efficiently and reliably."

Image: BERNINA

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