

// Application report BST ProControl: Thickness measurement and control at Klöckner Pentaplast



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WIN-WIN SITUATION IN TERMS OF PRECISION AND SPEED

Klöckner Pentaplast relies on expertise from BST ProControl

With 18 production sites in 12 countries and more than 3,200 employees, the Klöckner Pentaplast Group based in Montabaur is one of the larger manufacturers of plastic films for the packaging of pharmaceutical products, medical devices, foodstuffs and electronics and for general moulded packaging. At the headquarters in Montabaur, which this year celebrates its fiftieth year, the focus is on the manufacture of high-quality PVC and PET films for the pharmaceutical and food industries. Klöckner Pentaplast is able to meet the consistently high quality demands for these two customer segments thanks to ongoing regular investment in innovative product technologies. With regard to the development of modern and efficiently functioning roller systems, those responsible set ambitious goals - all with their customers in mind.

Pioneering measuring solutions obligatory

One of the challenges for the two engineers Stefan Müller and Tobias Opper, who work in the Process Technology department at Klöckner Pentaplast (kp), is thus the development of failsafe and efficient systems.

In line with this, the company also makes use of pioneering measuring systems to meet the quality objectives. It's here that the experts from BST ProControl, with whom the globally positioned film manufacturer has already been working since 2006, come

in. The supplier portfolio includes measuring systems developed in-house to ensure the best production for each specific product. Here, the sensor technology already incorporated records the thickness of the surface weight of the film material contact-free even during production. The hard and software configured specially for the customer's requirements record this data and manage the quality of the film by means of actuators. „Our objective was and is not only to significantly boost the speed of our systems, but also to ensure the consistent quality of our films. Hand in hand with this, we need to reduce material rejections to a minimum and shape production so that it is as efficient as possible“, says Stefan Müller.

The technology implemented by Klöckner Pentaplast on the total of nine roller systems at its Montabaur site involves radiometric measuring solutions, which act as one unit specially configured to the requirements of Klöckner Pentaplast. The choice of supplier plays a crucial role for the two managers responsible, since there were various measuring systems from a wide variety of suppliers in the past. „Initially we only used one system from BST ProControl, formerly betacontrol - all the others came from competitors,“ Tobias Opper explains, adding: „The colleagues who operate the systems on a daily basis clearly favoured the BST ProControl system thanks to the precise measuring results as well as the user-friendliness and good service.“ Building on this basis for decision-making, a further roller system was put in place, with the aim of making it possible to boost productivity and, in line





with this, also the speed of work to an average of 50-70 m/minute up to a maximum of 200 m/minute. *„We were and indeed are determined that this of course does not have a detrimental effect on quality, and so we considered how we might work with BST-ProControl to be able to adapt the thickness measuring to increased demands“*, explains Stefan Müller, adding that the systems are in operation around the clock, seven days a week.

Further along in the process, the vibration behaviour of the roller, which is dependent on the mechanical construction, also represented a challenge. This was something the supplier was able to tackle successfully, and in doing so was impressive in terms of its flexibility and its willingness to both tailor the measuring solutions precisely to the specific requirements of the manufacturing process and to collaborate as a team on the project. Ultimately, the precise and consistent measurement meant that thickness regulation could be ensured in real time, featuring absolute value positioning as well as a new drivetrain.

The activation represented an important foundation stone for the globally planned standardisation within the Klöckner Pentaplast Group. Subsequently another roller system fitted with the measuring solutions from BST ProControl was put into operation in Thailand, as well as in other international locations, in 2011. Klöckner Pentaplast based its decision to opt for the radiometric measuring procedure on the effects specific to the process and material. Process deviations could thus be recorded more quickly and the thickness measurement of the PVC film determined up

to 30-1,000 μm with accuracies of $\pm 0.4\%$ or $0.4 \mu\text{m}$. During the ongoing traversing, the measuring signals are transferred to the evaluation system along with the relevant measuring position and are prepared for visualisation here. At the same time, the measuring head records the thickness of the material across the entire width of the PVC film web and evaluates it in parallel to this.

The measuring solutions used work according to the irradiation measuring process. This makes use of the fact that every emission is weakened as it passes through the PVC film material. There is a source of radiation in the form of a radioactive isotope in the shielded sensor. By way of protection for the user, the sensor shield only permits the radiation to be emitted in a tight bundle of radiation in the direction of an item to be measured. This radiation can then be detected behind the film under production by an ionisation chamber.

The detector signal is proportional to the intensity of the radiation that is able to pass through the PVC film and thus functions for the determination of the thickness of the item to be measured. *„We are also planning the future with BST-ProControl, since the flexibility and willingness for personalisation of the measuring solutions is a real USP for the company“*, explains Stefan Müller.

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BST ProControl is specialized in the planning, production, implementation and modernization of instrumentation, control (e.g. coating thickness, layer thickness or basis weight) and automation (ICA) components.

Sensors designed for specific applications, combined with sophisticated automation and visualization systems, ensure precise registration, complete monitoring and analysis by basis weight measurement.

All measuring solutions by BST ProControl are applied in very different production processes, starting with plastic and metal sheeting, paper and textiles. The productions of foams, floor coverings, non-woven fabrics, metal sheets as well as products for the automotive industry are also important areas of application.

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Do you have any questions or wishes concerning our service offer? The head of our service centre, Ms Heike Wachlinger, is looking forward to your call or email.

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Contact us: We are there for you!

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