

// Application report BST ProControl: High precise sensor Indispectro at Bilcare Solutions



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IT'S BETTER TO BE SAFE THAN SORRY

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Pioneering measuring solution revolutionizes high-quality film coating at Bilcare Solutions

Bilcare Solutions is an international manufacturer of calendered and extruded hard films. Its production and marketing activities are focused on manufacturing hard PVC and PVC-PE films as well as upgrading these films through coating, stretching, laminating and metallizing. Its range also includes extruded PET films. With more than 50 years of experience, Bilcare Solutions is today one of the globally leading manufacturers of hard films.

Its workforce of 1,200 people are employed at ten factories that are located throughout the world on three continents to ensure that above-average quality is already guaranteed during production and finishing. In line with the high demands that the company makes on itself, the entire process of production is operated in accordance with a quality-management system that is certified in compliance with ISO 9001:2008 and that absolutely guarantees that the products deliver the quality that Bilcare Solutions' customers all over the world demand.

Process optimization – quo vadis?

But how can even low numbers of rejects be reduced even further – ideally towards to zero? One of the best methods for achieving this objective at Bilcare Solutions generally and not just

at its Bötzingen location is the deployment of intelligent process optimization solutions. The factory in Bötzingen manufactures 35,000 tonnes of pharmaceutical packaging films a year with an annual total of around 16,000 tonnes being laminated and coated and supplied to the global market as high barrier films.

Top quality is given such a high priority at Bilcare Solutions because it is the company's mission to supply only perfect products to customers. „Take the films for manufacturing pharmaceutical blister packs, for example. They are absolutely part of the approved drug. Any deviations from the coating's specified tolerances are not only impermissible, they would also result in the film being rejected,“ explained Clemens Beckenbauer, Project Manager Automation Germany, while continuing to state that customers in particular demanded coating layers with tolerances that moved within a maximum range of just 5%. Depending on requirements and the application, layer tolerances could even be as low as two micrometres, which is the equivalent of a deviation of 0.5% from specifications. „Packaging that varies too greatly from the specified limits may even mean that products aren't sufficiently protected because the film is simply too thin,“, explained Mr Beckenbauer while stating that, depending on the required barrier properties, a layer of between 40 and 200 g PVDC needed to be applied to films used in pharmaceutical packaging.



Coating plant uses precision spectrometer measurements

To date, continuous measurements were carried out during production on the coating plant using radiometric systems. Bilcare Solutions has, however, in parallel switched to a different even more precise solution. As a result of the latest developments at BST ProControl, IndiSpectro has now also been deployed at the plant. From the start, Clemens Beckenbauer placed his trust in the new measuring technology that employs spectrometer sensors that utilize the wavelengths of light to optically compare the thickness of layers. The new technology's high signal-processing speeds make it possible to calculate layer thickness with absolute precision. IndiSpectro was therefore predestined for the task of measuring Bilcare-specific mono- and multi-layered films and decisively determining layer thickness at the plant. Thanks to very fast digital-signal processing, it is possible to calculate the thickness of films very exactly. The non-contact and non-destructive measuring system that traverses the coating equipment at the factory in Bötzingen achieves precisions of +/- 0.04 µm.



Simple principle

The measuring principle is based on the optical comparison of layer thickness using the wavelengths of light. When a ray of light hits a transparent layer, some of the light is reflected at both the top and bottom boundary surfaces. The two reflections become overlaid and thus produce an interference spectrum that results from the refraction index and the thickness of the layer through which the light travelled. The precise end result can then be determined using the measured results. According to Mr Beckenbauer, the facts that there are no absorption effects and that the spectrometer is so robust even in industrial environments constitute additional benefits. *„In our opinion, what's really special about this system is the fact that temperature-related material fluctuations do not affect the measured results although they do create variations in the thickness of materials measured during production. The IndiSpectro sensor adjusts for these deviations from the end value as it is able to determine the final thickness early on and independently of the material's temperature.“*

But, besides the product's ability to measure layer thickness, he also explained that there was an added benefit. He stated in review that the actual challenge that the experts at BST ProControl faced during the project was to find a way of calculating the applied layer of PVCD in grams per square metre so as to span the arc from layer thickness to surface weight. This because, after the concluding process in which an individual structure is created during the final pass, Bilcare Solutions charges its customers on the basis of how heavy the layer that has been applied is in grams per square metre. *„We were really impressed with how much process-engineering know-how and commitment BST ProControl brought to the conversion calculations and documentation against the backdrop of technical production requirements.“*

And the results are not only being used for Bilcare Solutions' measuring and control tasks. *„We operate our own statistic process controls and incorporate all values that are measured online into our Cp, CpK calculations. This enables us to make trend forecasts over the long-term and improves our own process stability,“* explained a satisfied Mr Beckenbauer. *„We are already planning follow-up projects with BST ProControl and are delighted to have found such a reliable and flexible partner. We were in particular really pleased with the personal service, the flexibility with which special requests were taken up and how we were treated as equal partners in the relationship.“*

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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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Contact us: We are there for you!

We are happy to help!

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