Transparency saves cost and provides security

Importance of process control with technical textile

Where looks play an important part with ready-to-wear garment, to technical textiles applies the motto. 'Form follows Function'. It all goes the same for protection clothes, dike reinforcement and medical textiles: they have to fulfill their task to 100% in order to prevent damage and danger. That responsibility extends to production. The final product has to strictly meet these requirements. "We are talking about zero tolerance here. Grey areas cannot be accepted", says Stephan Kehry, Area Sales Manager at Mahlo GmbH + Co. KG. The processes therefore have to be transparent, so that the user can recognize discrepancies at any time and can react to them.

"Risks for example are distorted web or variances in the coating application." Too much or too little product results inevitably in post processing or reject in the worst case. That in turn causes dissatisfaction with the customers and additional costs. The producers counter that successfully by counting on process and quality control – and killing two birds with one stone. They not only get high-quality goods but also save energy and material cost with the 'right first time' principle.

Fig. 1: Orthomax RFMB-15: Fusion of Pinwheel and Roller Straightener

"Prerequisite for a working product is – independent of further treatment – straight web", Kehry explains. At Mahlo, the Orthopac RVMC-15 makes sure of that. The renowned automatic weft straightener detects and straightens 97% of all known web. For s-shaped distortions and non-detectable fabric, the machine builder counts of pin wheel straighteners. "They work only for non-elastic products, however." This is different with the Orthomax RFMB-15, a fusion of pin wheel and roller straightener. Thanks to combining both technologies, the system minimizes distortions in web as well as elastic knitting. Many textiles made of elastic Raschel knitted fabrics already benefit from these advantages.

Quality control: quantity matters

Fig. 2: Qualiscan QMS at work

With straight goods, the foundation for a high-performance product is built. "The next step is monitoring the further processing, for example the coating material for coated fabrics." With the help of scanners and sensors, the Mahlo quality control system Qualiscan QMS-12 makes important parameters visible and therefore controllable. "The basis weight has much significance in knowing if the composition of the single layers is right", so Kehry. By measuring before and after the coating, one can determine the weight of the single layers. The producer then knows if too much or too little material is used. If the amount is too low, the functionality is affected; is it too high, additional costs are caused. However, the correct application quantity is not only a cost factor, but can even be vital. If you only think of fireproof protective clothing for the fire brigade, you have to be able to rely on its function 100 percent.

There are several possibilities to detect the basis weight. With a transmission system using beta sensors, the intensity of beta rays is weakened according to the mass of the penetrated layer. This weakening allows determining the basis weight of nearly all materials. As an alternative to that, Mahlo uses sensors with y-ray. Here too, the intensity of X-rays is weakened according to the mass of the penetrated layer.

Coating thickness as important parameter

Another crucial parameter that helps to control the quality of technical textiles is coating thickness. In addition to beta and x-ray sensors, Mahlo works with laser triangulation. A laser beam is projected on the measurement object and reflected. Analyzing the positions of the light beams and the distance from laser to receiver, one can calculate the coating thickness. "There are, however, situations where the laser trian-

gulation reaches its limit. For example, if the material surface is structured or very rough." For these cases, Mahlo has developed a special sensor that acts mostly independent from the surface. A combination of eddy current sensor and shading sensor makes the measurement insensitive against material surface, color, transparency, opacity and temperature variations.

Fig. 3: Flood protection can only fulfil its task with the right coating.

Company founder Dr. Heinz Mahlo already knew "what you can't measure, you can't manage". For high-performance technical textiles with their various tasks it is crucial to be informed about latest measuring values so that you can intervene if needed. "The result is a cost efficient and simultaneously high-quality product that satisfies producers and customers."

Those two parties play also an important role in the contemporary topic Industry 4.0 (or Internet of Things). By a simplified and direct data exchange, the end user can keep track at any time where and especially how its product is fabricated. With that, not only a trouble-free value chain is guaranteed. The end user can also be absolutely sure that its fabric is always produced with the right parameters. It is a good feeling to know that the tire cord and the airbag in one's car or the roofing in the football stadium have most likely been manufactured with Mahlo-technology.