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Multitexx spunbonds: high-strength featherweights

Antistatic laydown belt for even greater process efficiency

Nonwovens are real all-rounders. Thanks to their extreme versatility and adaptability, they are being deployed in more and more applications in the hygiene, medical, construction, industrial and environmental sectors. And thanks to their cost-efficiency, they are also increasingly replacing conventional materials. There is a constantly growing demand for lightweight, high-strength spunbond nonwovens – a demand to which the newcomer company Multitexx GmbH, based in Herdecke, Germany, is responding with high-grade polyester (PET) and polypropylene (PP) spunbonds for challenging applications. As a subsidiary of the Dörken Group – also headquartered in Herdecke – Multitexx has access to over 15 years of experience that its parent company has accumulated with Reicofil production line. One significant contribution to the efficiency of this demanding production process comes from the laydown belt deployed: a CONDUCTIVE® 7701 type belt made by GKD – GEBR. KUFFERATH AG. Multitexx and Dörken are so impressed by its durability, flexibility, antistatic features and excellent cleaning properties that they have decided to use the belt for a second, even more high-performance production line.

Through its membership in the internationally operating Dörken Group, Multitexx benefits from almost two decades of spunbond production know-how. The parent company, founded 125 years ago, was already developing and producing underlay sheets for pitched roofs as early as in the 1960s. In 2001, Dörken acquired a Reicofil spunbond line and began its own in-house production of spunbonds for the composite construction laminates market. After 15 years, the rapid growth of business made it necessary to procure a second, extremely high-performance Reicofil line. This solved the production



WORLD WIDE WEAVE

capacity problems at Dörken, and also triggered the establishment of Multitexx. Since January 2015, the new company has been selling high-grade spunbonds made of thermo-calendered polyester or polypropylene.

PET and PP on one line

What's special about the Dörken Group's two Reicofil lines is that they can alternate between the two polymers and manufacture spunbonds of either material with low grammage and very high consistency. There are two particular challenges involved in this: the different process temperatures of the two materials; and the considerably more complex production process for polyester spunbonds. The polymers enter the production lines through separate feed lines that are modified for the respective raw material. Since polyester granulate agglutinates at a temperature of 80°C, it has to be pre-crystallised and dried before extrusion. It is then fed into the metering chamber which feeds the extruder. Polyester is extruded and melted at significantly higher temperatures than polypropylene. The melted polymers – PET or PP – then move on to the spin pump. The melt is conveyed into the spinneret and distributed seamlessly over the full width of the line via a single-piece die. Thanks to its single-piece construction, which is configured to the production line's working width of 3.2 metres, the die prevents the potential flaws in the nonwoven that might form due to the welds created by multi-piece dies. In this way, the spinneret of the Reicofil line creates filaments with a filament count of approx 2.5 dtex. These are then stretched into endless filaments through a long diffuser with temperature-controlled air and high air speeds. This gives the polyester filaments the desired strength. The stretched endless filaments are swirled and deposited as a random fibre mat onto a circulating wire mesh belt. The transformation of polymer granulate to spunbond nonwoven takes place in a closed system, so the filaments only come into contact with the surrounding air shortly before being discharged onto the laydown belt. This ensures the particular stability of the



WORLD WIDE WEAVE

process and explains the high product quality of Multitexx spunbonds. The unique identifier of these spunbond products is the oval-shaped imprint created by the embossing roller in the thermo-calender. The rounded embossing is designed to improve the tear resistance of the nonwoven product. Subsequently the high-grade spunbond nonwoven goes through the stages of cooling line, defect inspection, longitudinal cutting, cross cut unit and winding before it finally arrives in dispatch.

Unparalleled uniformity

Multitexx offers polyester spunbonds with a filament fineness of approx. 2.5 dtex, equivalent to 2.25 Denier, in a wide range of grammages from 15 to 150 g/m². In addition to high uniformity, their product qualities also include high tear-strength, temperature resistance and very little shrinkage. In the case of polypropylene spunbonds, available grammages of nonwovens made of pure PP filaments range from 17 to 100 g/m². The specific grammage is determined by the speed the laydown belt is run at. The higher the belt speed, the lighter the nonwoven. The main customer for Multitexx spunbonds is the automotive industry. A range of spunbond variants are used in vehicle construction, for example as sound insulation, as electrical insulation or as material for filter elements. Their high degree of uniformity also makes them eminently suitable for the fluid filtration sector, where they are successfully deployed in a range of tasks from cooling lubricant filtration to beer filtration. In addition, spunbonds are also used for air filters in air-conditioning and ventilation systems as well as for filters in vacuum cleaners. These high-performance spunbonds are also in high demand in the construction sector, where they are deployed for a wide range of purposes from roofing membranes, roofing accessories and façade sealing strips to applications in civil engineering, horticulture and landscaping. "Our polyester spunbond is unparalleled in its uniformity," says Michael Mertens, Key Account Manager at Multitexx, explaining the success of the company's



WORLD WIDE WEAVE

product. In his opinion, other factors that contribute to the constant high demand for this spunbond that has prevailed since the foundation of the company are the guaranteed reproducibility of customer-specific properties and the fact that they are *Made in Germany*. Delivery time reliability thanks to geographical proximity is a key success factor, particularly for manufacturers of critical mass products. And last, but not least, customers also benefit from the company's exceptionally comprehensive laboratory competence with their own test certificates.

Excellent cleaning properties

Both spunbond lines are in round-the-clock operation – with a correspondingly high throughput. If it is to withstand the strain long-term and not cause costly downtimes, the laydown belt needs to meet very high standards. Andreas Falkowski, team leader of spunbond line 1, explains the complex demands on the belt, which performs a crucial role in the spunbond production process: "The wire mesh belt has to be designed for our very high production speeds. Furthermore, the belt edges have to be reinforced and joining the belt ends into an endless loop has to be an easy job. Besides the required robustness, we also need the belt to have sufficient flexibility to handle the turns round the tight radii of our capstans without any problems." Mr Falkowski sees the belt structure as another crucial aspect. The air permeability and the uniformity of the mesh can strongly influence the distribution of the filaments and thus, ultimately, the quality of the product. In his opinion, GKD's CONDUCTIVE® 7701 circulating laydown belt – 3.8 metres wide and almost 33 metres long – meets this wide range of requirements perfectly. "We installed the belt and could start producing immediately, without any problems," Andreas Falkowski recalls. The wire mesh belts previously used by Dörken for the production of Multitexx spunbonds were not antistatic. "Thanks to its special monofilaments, the GKD belt prevents the build-up of process-related electrostatic charges.



WORLD WIDE WEAVE

That's an important additional bonus for us," the team leader points out. "Another thing is, according to colleagues from the shifts, that this belt is much easier to clean of droplets. All they need to do if there's a filament on the belt is to wipe over it with a sponge." For Andreas Falkowski, this is a really important advantage of the GKD belt. About every seven weeks, the line is reconfigured from PET to PP. "But if there are PP droplets on the belt, we can't use it to produce polyester spunbonds. We have to install a new belt," he says, explaining the significance of the easy cleaning properties of the GKD belt for production efficiency. Michael Mertens adds: "All the colleagues responsible for the process were so satisfied that, in the meantime, we have placed further orders for belts from GKD." Two of these belts are ready for delivery on demand – one of them for the new Reicofil line, which will also switch over to this belt type. "In terms of its product features, the GKD belt is the best we've ever had on our production line," says Andreas Falkowski, explaining this decision. For this reason, another belt was ordered from GKD and is currently being produced. This time, the belt will be the novel CONDUCTIVE[®] 7690 type, which is characterised by a significantly rougher belt structure in the running direction. This innovative construction gives the belt a special grip that, among other things, improves traction in the laydown zone and at the same time further optimises the belt's cleaning properties. "We haven't ever had problems with starting up after a belt change," says Andreas Falkowski, "but the rougher surface should make it even easier to remove droplets from the belt." In addition, the antistatic function of this new belt type is even stronger, which – in his opinion – also speaks for the new belt. In a nutshell: the best conditions for a continuation of the successful cooperation between these two reputable family businesses – both prime examples of the German "Mittelstand" – in the challenging nonwovens market.

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WORLD WIDE WEAVE

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