

# Developing machines for tomorrow today

Just as Kampf Schneid- und Wickeltechnik launched a new slitting rewinding line for processing demanding battery foils, C2 met Maik Krüger, head of product management, to discuss the company's successful developments in the area of separator films



Maik Krüger, head of product management at Kampf



The battery film has been slit and rewound

**W**hen the 20th James Bond movie 'Die another day' hit cinemas around the world 10 years ago, once again 007's car gained a great deal of attention. At the push of a button the Aston Martin V12 Vanquish became invisible but what was only possible by using digital effects has almost become reality as Mercedes Benz recently showed. For a TV commercial the Stuttgart-based car maker attached LEDs to the driver's side of a car. A camera filmed everything that was happening on the passenger's side and brought the data superfast to the LED plane. This led to the impression that the car was invisible.

Even though it is quite unlike that this little experiment will enter our everyday lives by showing the potential of so-called intelligent materials. The number of novel materials with multiple functions and great capacities rises at great speed and so does the number of possible applications. This fact offers great and ever-changing challenges for machine makers as well.

**C2:** "Innovative materials are playing an ever-increasing role in industry generally so

what potential do you see for new materials for Kampf Schneid- und Wickeltechnik?"

**Maik Krüger:** "Since energy consumption is rising while fossil fuels are shrinking globally, the need for alternative energy sources is getting ever bigger. Of course wind farms and solar fields are already producing energy in a reliable way but the main challenge is being able to supply the energy through suitable transport and storage media."

"Although their performance still has to increase and their price has to shrink, lithium-ion batteries have proved themselves as high-performance energy storage devices with all-round talents that are an indispensable element in many areas of everyday life. Applications range from mobile phones and similar devices to electric vehicles. The importance of lithium-ion batteries will continue to increase, especially when their reliability and safety are enhanced and continuing problems like durability and temperature resistance are solved."

**C2:** "Where do slitting and rewinding lines come into play?"

**M. Krüger:** "An essential part of these batteries is the polymer film separator which isolates anode and cathode from each other to avoid a short circuit. In order to enable the needed electrochemical reactions to happen the separator has to allow for the transport of ionic charge carriers at the same time. The quality of the separator is essential for the quality of the battery, its performance, life and security. So it is apparent that the processing of these films is of great importance."

"We have been active in the development of machines for processing battery films since 2010 and are in close contact to producers, institutes and machine makers. This network grants us a good insight into research projects concerning new materials, especially in new energies. It is also an important source for our tailored and future oriented machine concepts."

**C2:** "Which machines from the Kampf portfolio are suitable for the processing of separator films?"

**M. Krüger:** "Our machines cover all areas of the production processes

of separator films. We offer non-stop winders for film production, which can be equipped ideally for inline slitting. Additionally, machines for primary film slitting for intermediate and end products and lines for full assembly in battery production are part of our portfolio. We offer additional systems for roll handling. As mentioned earlier our solutions are very individual and customised."

"This is why we put a great deal of attention on ensuring the practical suitability through tests and a series of experiments which are undertaken at our technology centre and laboratory with the right machinery and qualified staff. Through our everyday work with these demanding materials we are on a continuous learning curve that influences our machine concepts. Of course our know-how is also enhanced by the machines that are already in operation."

**C2:** "What makes the processing of battery films especially complicated?"

**M. Krüger:** "Every producer of separator films basically brings new know-how and special product differentiations into the assembly. This is why we, as a machine maker, are confronted with a whole lot of different film properties that require very individual processing technologies. Even our customers are sometimes surprised to learn of the difficulties the processing of their materials poses for our machines. Typical influences to slitting and rewinding are the huge variations in the thickness of the film, the pronounced sheet transport and the tendency to wrinkle."

"As the film producers keep enhancing their films, their properties are ever-changing. This is why it is essential for machine makers to have as much knowledge as possible about the different films and their behaviour during slitting and rewinding. For instance, the application of ceramic coatings onto the film directly affects the detail solutions in our machine design."

"In terms of purity and quality control battery films have very high demands. We

have to ensure that no scratches, wrinkles or defects are caused during winding. We also have to prevent contamination through dust or different particles. Accordingly, our machines are suitable for clean rooms. In addition, we are in the middle of integrating highly efficient modules for contact-free web cleaning and inline inspection systems into our lines."

**C2:** "What are your targets in this area in the medium and long-term?"

**M. Krüger:** "Well, first of all we have successfully introduced machines for this area into the market and thereby reached an important milestone. These lines' high production stability and roll quality have already led to a number of follow-up orders. Right now we are focusing on enhancing the productivity and performance data of our machines. We are not limited to separator films and see ourselves well equipped for the processing of different intelligent materials as well." ■

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