

Ten questions for...

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executive partner, and

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Sustainable Nonwovens:

Please, tell us a little about Schlegel und Partner?

Silke Brand-Kirsch: Schlegel und Partner is a market research and consultancy company for technology-focused fields. For 25 years, we have been delivering analysis and insights aimed at opening up new horizons and opportunities for a global clientele. As business growth consultants, we specialise in client-specific business-to-business market research and consultancy for complex products.

We ferret out opportunities, expose risks within existing markets and identify potential for new materials, products or clients. We provide the missing link between market research and strategic consultancy going to new lengths to provide our customers with a sound foundation for strategic and operational decision-making to.

SNW: At the recent Nonwovens for High Performance Applications conference in Cannes, you spoke of the growth of nonwovens in light vehicles. It's been pretty impressive hasn't it, over the past ten years?

SB-K: Absolutely. At present around 2% of all nonwovens production in Europe is going into over 40 applications in light vehicles production. Since 2007, the volume of nonwoven material applied per vehicle has risen from 3 kg to 8 kg – equivalent to roughly 30 square metres in each vehicle.



Silke Brand-Kirsch.

SNW: Of this 8kg and 30 square metres of material per vehicle, what are the key applications?

SB-K: Most of the nonwoven materials for light vehicles are applied as interior trim or as NVH (noise, vibration and harshness) protection. Reducing engine and driving noise as well as vibration allows for a quiet journey, even at high speeds. Obviously, the comfort of drivers and passengers plays a major role for most nonwoven applications. At six square metres, the largest volume of nonwoven materials is used in the car's underbody, followed by carpets and car seats with four square metres each. Other areas of application are in door linings, bonnet (hood) liners, wheel arches and headliners.



Dorothea Slevogt.

SNW: Now as most people will be aware, the automotive industry appears on the brink of tremendous changes. What in your opinion are the key megatrends in this respect?

Dorothea Slevogt: The whole transport and mobility sector is undergoing an all-encompassing transformation as urbanization rises beyond 50%. There are ground breaking technological innovations and many new, mainly digital business models. There is political pressure to tackle environmental challenges and customer demands are changing too. At the same time, there is a growing car population, especially in highly populated, emerging countries like China and consequently inner-city congestion is on the rise.



These trends have led to a number of new mobility concepts impacting the automotive industry. To name just one, in China in particular, there has been a boom in car, bike or ride sharing due to strong governmental support. It is the Chinese government's target to increase individual mobility efficiency because it is still lacking behind China's tremendous industrial development. The Chinese ride hailing company Didi Chuxing has become the largest hail ride provider in the world within just a few years. It is solely based on a digitised system used via the Wechat mobile phone platform.

SNW: What are the key drivers that will move forward the production of battery electric vehicles (BEVs)?

DS: The key drivers are legislation and the further development of the required technology. Countries like China, but also Germany and Japan, see a big chance for the development and sustainability of their car industries through tackling electrification. The Chinese car manufacturers see a big opportunity for their market development in this field. In China, 90% of all car sharing vehicles are entirely electric as the Chinese government is leveraging car sharing to stimulate the new energy vehicle (NEV) market. Thus, a completely new league of companies has entered the BEV market. China's traditional OEMs, like BAIC and Changan, have also

announced plans to stop producing internal combustion engine (ICE) cars completely by 2025. Most governments are now encouraging the production and use of entirely electric vehicles in order to meet targets for the reduction of greenhouse gases and of the consumption of petroleum products. While the price for a purely electric vehicle is usually still double that of a conventional car, governments are offering incentives such as subsidising the purchase, providing tax reductions or even exemptions, as well as the priority lanes and free parking in inner cities that have been introduced in China. E-quotas and fleet targets are also moving the market forward.

SNW: There are many different forecasts predicting how BEVs will grow in the period to 2030. What's your view?

SB-K: Taking all positive advantages and obstacles into consideration, Schlegel und Partner generated three scenarios, with the most progressive predicting penetration at 25%. This is provided that limitations including battery range, the lack of infrastructure, energy supply, recycling alternatives, cost and charging times can be tackled within the next couple of years. More realistic, is a market penetration of up to 15% until 2030. Other institutions and consulting companies, such as the ING Bank, anticipate a complete switch from ICE to

BEVs by 2035, once price and quality issues are overcome. From today's perspective, we do not see that happening so soon.

SNW: At present, who is leading in BEV production?

SB-K: The Renault-Nissan-Mitsubishi alliance (RNM) is still leading the BEV market with a 23% share of the estimated 1.3 million units produced by the end of 2018. However, Chinese OEMs dominate the market with an accumulated market share of over 32%. In addition to the largest BEV producers, among them BAIC, Geely, BYD, Changan, Jiangling and JAC, there are also numerous smaller Chinese companies who have emerged with regional production programmes in recent years. Toyota, Mitsubishi and Nissan have all started to produce BEVs in China this year. China still has the largest BEV market in the world, selling almost 600,000 in 2017, followed by the US with nearly 200,000. In the US, Tesla is in the lead with a market share of 11% in 2017 and an expected share of 15% in 2018.

SNW: Where can nonwovens help to improve the features of BEVs?

SB-K: Electric cars still face three major obstacles – driving range, charging system and sales price. BEV makers need to overcome these barriers to achieve a higher market penetration. Lightweight nonwoven materials can help to reduce ▶

car weight, instead of using larger more powerful batteries. Nonwovens tend to be 15-30% lighter than traditional materials like woven variants or plastics, reducing the car's weight by more than two kilograms. Also, nonwoven automotive carpets provide weight savings of up to 40% compared to woven carpets. Most nonwoven materials are in addition cheaper than their conventional counterparts. Underbody shields and wheel arches, traditionally made of plastics, are now increasingly made of nonwoven materials.

Research institutes like the STFI in Germany are developing even more cost-saving nonwovens based on glass-polypropylene composites, which are denser and much lighter than carbon or recycled carbon. Battery separators for high-performance lithium ion batteries can also help improve the battery's efficiency and provide better high temperature stability.

New mobility concepts like car sharing require more robust, simpler and easier-to-clean interiors, while autonomous driving allows for new interior concepts and provides more room for the individualisation of interior design. The car interior becomes part of the car owner's personal life style, while drivers turn into passengers, free to experience the car's interior in ways previously unimaginable. There is ample room for nonwoven suppliers to create new materials and designs.

SNW: But at the same time, should we face up to the reality that a lot of nonwoven applications for ICE light vehicles will disappear?

SB-K: Large combustion engine-related applications, like bonnet liners, outer dashes, encapsulation, under engine shields and filter systems will indeed disappear. Plus, today's NVH concepts based on sound and vibration of the combustion engine will become redundant. However, other applications like headliners, doors, seating, carpets, underbodies and wheel arch linings will remain untouched, even in BEVs.

In addition, nonwovens suppliers can work on creating new NVH concepts for electric vehicles to deal with the inverter's electric-magnetic whining



sound, as well as improving acoustics and in-cabin comfort when road/tyre and wind/air sounds become more prevalent.

SNW: So what is the Schlegel und Partner forecast for the market size and growth for automotive nonwovens from now until 2030 and where are the opportunities and threats in the near term?

SB-K: We expect nonwovens in light vehicles to grow at 2% annual until 2030. The market penetration of BEVs will evolve further but not supersede ICE vehicles until then, as we anticipate at least 80% of the light vehicle production to still have internal combustion engines. Nonwovens in light vehicles will grow at almost twice the pace of LV production and are far from reaching saturation. With new mobility concepts underway, light vehicle production is projected to grow at a slowing pace of no more than 1.3% annually until 2030, worldwide.

If the nonwoven industry takes the chance to participate in new developments for advanced mobility concepts, including BEVs, windows of

opportunity will be wide open. This includes tougher and easy-to-clean materials for car sharing, new NVH concepts for new sound profiles and sources and lining and padding for additional components replacing more conventional materials to further reduce weight or for interior designs in autonomous driving.

Additionally, new customer-supplier relationships with new players in the industry are possible. Nonetheless, material prices will increasingly gain significance in order to achieve higher market penetration of BEVs.

Nonwovens suppliers are experiencing intensifying pressure to remain competitive. As China currently operates the largest BEV fleet which is growing faster than the rest of the world, Chinese nonwovens suppliers are able to strengthen their market position, while European nonwovens companies will struggle to remain competitive.

The BEV market will become much more diverse than the conventional automotive market due to its disruptive trends. **SNW**