

IN TIME

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WHAT MOVES US FORWARD? WHAT PUSHES OUR BUTTONS?

ELECTRIFIED, CONNECTED, AUTONOMOUS, SHARED ... THE LIST GOES ON.

... These megatrends have attracted the attention of—and are revolutionizing—the whole automotive world. Each of these critical attributes is part of the DNA that will ensure the competitiveness of future vehicle generations. The scope of this development can be compared to the change from cell phones to smart-phones—in other words, a disruptive innovation. Hands-on experience gained over many years is becoming obsolete. At the same time, automakers are venturing into uncharted territory—a market with competitors who never had been on their radar before.

In addition to the powertrain, the core competence of today's automakers is in the shell. Critical to the safety of a vehicle in the event of crash, it is considered a „can't touch“ item that is off the table in the development of a vehicle. Pure electric vehicles require a fundamentally new body-shell concept and the integrated battery responds extremely sensitively in the event of a crash. This is just one example of what is behind the term „electrified“.

Lightweight construction, sustainability, infrastructure—these and many other mountains have to be climbed. In addition, future vehicles will be smart, intuitive to operate in a broader sense, and will integrate into our everyday lives in many ways. Everything that simplifies access to mobility for the end customer exponentially increases the complexity of electronics, software and the required computing power in the background. „Connectivity“ and „autonomous“ are likewise new territory for automakers. They rely on development partners that come from sectors other than the

automotive sector for these innovations. The change process outlined above consumes vast amounts of resources and investments that need to be amortized in a timely manner. What do you think when you hear the trendy buzzword „Shared“? A car used to be a status symbol, and everyone associated it with a special kind of freedom. Today's target group is interested in mobility concepts. After all, who still needs a car in major urban centers? Therefore, it is necessary to contemplate diversification from an automaker to a mobility provider.

We have to change our thinking to a new approach. In an effort to cut costs, companies used to search the world's economies looking for the cheapest component supplier. Now, our social conscience and increasingly elevated awareness of sustainability point us to the green road. The only way to keep our planet livable is for us all to understand that this will be possible only through decarbonization—making the switch from carbon in our personal lives and in the economy at large. CO₂-neutral mobility makes a critical contribution here.

We are already well into these unstoppable processes. In addition, the current crisis acts as a catalyst and significantly increases the speed of reaction. Decisions with strategic consequences must be made at short notice in order to deploy scarce resources in a targeted and future-oriented manner. Imagine the damage that a bad decision could do to a company in the current situation.

For companies that want to bring about change and move it forward in this productive state, we can sum it up by saying that



Dear Readers,

We find ourselves at the beginning of 2021 - a new year. What will it bring? Will we get the pandemic under control? Can the economy continue to stabilize? What is the responsibility that we have as companies, and what issues must economic policy regulate? We embrace change and see it as a positive challenge that we are happy to face together with you. Technology is our passion, customer satisfaction our ultimate goal.

We wish you a healthy and successful 2021!



Peter Schnitzer

Peter Kienzle

these are fantastic times. Schnitzer Group recognized this opportunity at an early stage and demonstrated in many future technologies the hands-on experience it has gained. We will settle for nothing less than reaching the digital benchmark. Our team has a great outlook towards the future and is glad to embrace the challenge of making any technical vision a reality. We look forward to sharing our expertise and optimism with your teams. 

FUTURE | FACTS | FIGURES



250
online service visits

Take a virtual dive into technical processes

Schnitzer Group is specialized in the industrialization of technical development projects. Employees dive deeply into processes with a high level of technical detail. It is necessary to optimize and examine these processes, both quantitatively and qualitatively. Up until early 2020, it went without saying that analyses of manufacturing processes or tools had to be carried out „at the scene of the crime“, so to speak, at suppliers' or customers' facilities to enable full sensory perception of the situation.

This remains the most effective method for dealing with complex technical situations. But due to the current circumstances, on-site appointments are only possible with restrictions, if they are even possible at all. This is why Schnitzer Group has made

a virtue of necessity and taken steps to facilitate virtual on-site appointments. We are equipped with the latest digital technology, which means we can use cameras, digital communication and data transfer to make the virtual „visit“ as realistic as possible.

Since spring of 2020, Schnitzer Group has organized more than 250 online appointments. This has given us valuable hands-on experience: What preparations are made for a virtual appointment, and what training is given to the company receiving the visit? How does the online appointment have to go in order to get reliable results? How are measures defined and pursued, and how is their effectiveness confirmed?

Our bottom line: With top-notch preparation and the latest communication technologies, a virtual appointment is a good alternative but can never be a true replacement for showing up in person, rolling up your sleeves and getting to work on site. Face-to-face communication right at the machine allows for more than just the bare minimum of technical information exchange.

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1000
cells – mission accomplished?

Electric pioneers – from the cell to the battery module

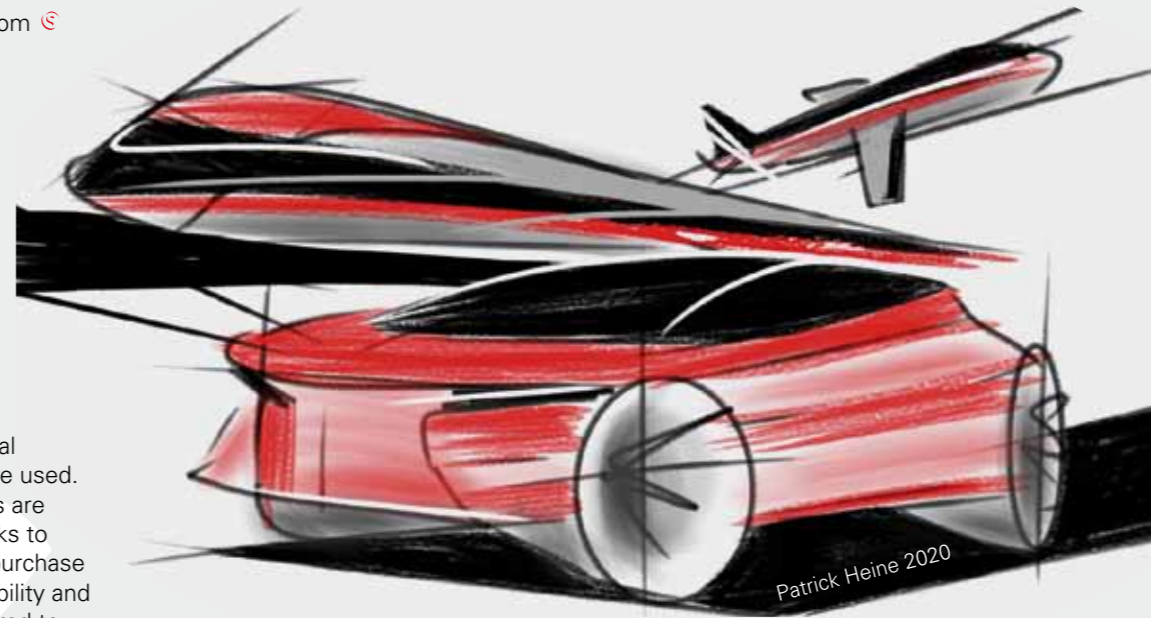
Innovative battery designs appear to have virtually boundless potential in terms of power density, charging times and sustainability. There is a long and challenging path from verifying the function under laboratory conditions to a large-scale series product that meets all criteria and specifications for safe operation in a modern vehicle.

For example, the battery module has a significant impact on the body concept, making it indirectly critical to the crash behavior. In the event of a crash or during operation in the limit range, even the

battery itself responds with a very high degree of sensitivity. This requires technical solutions to be found for temperature management or electrically connecting the cells through soldering or laser welding, either during development or later during product validation. From the individual cell to the installation-ready battery stack with more than 1000 cells, the manufacturing process also determines whether the product can be produced while covering costs.

Schnitzer Group employees combine their expertise in the production methods required for battery production and are already actively involved in the industrialization of battery projects. We draw upon our hands-on experience to support our customers in selecting the best production methods and processes, take care of technical project management, calculate costs and manage optimization and change processes. Making the right decisions here is what separates a vehicle with a mere electric drive from one with e-mobility.

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the components are being installed in the vehicle, their lower inherent stability must be taken into consideration to ensure that quality requirements are met. Schnitzer Group has extensive hands-on experience with NFPPs – both in their composition and in further processing them in hybrid injection molding as well as in laminating processes with various surfaces (films, artificial leather, real leather).

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365,1%

more electric car approvals in comparison to October 2019

Enjoy Electric

Requirements for mobility and sustainability are increasing: The automotive industry is moving into a new era. Traditional automakers have been developing gasoline and diesel engines for decades—it's in their blood. Electrical companies are known for their expertise in manufacturing electric engines for a wide variety of industrial sectors. Now suddenly the goal is to integrate their engines into driving systems. This involves merging expert technical knowledge from a wide variety of fields. Traditional automakers can no longer rely on the framework conditions for development that they have grown accustomed to and must adapt to a new situation. The safety architecture of the passenger compartment is being overhauled as the result of adding a battery and electric engine. The vehicle's 48 V electrical system (something of a „necessary evil“) is suddenly taking the spotlight and getting turned into

Tight enough to hold? Why seals are so critical

The ongoing trend towards e-mobility means new and complex tasks for elastomer processing. The foremost of these is to protect the electronics and drive battery from dirt and moisture. Particularly high standards apply to the seals for the battery modules. The geometry and chemical formulation must withstand the vast temperature fluctuations in driving mode and during charging operation. After maintenance intervals or repairs, the modules must be able to be completely sealed.

However, in terms of ongoing manufacturing processes in the elastomer processing field, the processes and their requirements also have to be reexamined and reevaluated on a regular basis. It is necessary to turn a critical eye towards processes and scrutinize them to uncover areas of potential improvement. In many cases, processes can be accelerated and optimized merely by modifying articles.



a high-voltage system with up to 800 V. This is an example of a mobile application suddenly requiring expertise that is otherwise found only in large-scale industrial facilities. Moisture – something that can be managed in conventional vehicle construction with the existing technical solutions – poses entirely new challenges in the context of an electric drive. Things can go haywire in a battery system when moisture spreads to the wrong places. Schnitzer Group has been active in this challenging field for nearly 20 years – from the first ZEBRA batteries to today's cell-to-pack batteries. Schnitzer customers appreciate more than just our expertise in technical solutions, which is based on hands-on experience in countless different industrial sectors. They also appreciate our keen ability to bring together diverse teams from a variety of industries to form one functional and highly effective unit. We speak the language of the automotive sector, making us the ideal option for preparing suppliers for the certification process!

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Our project team successfully reduced the process/heating time significantly by overhauling the article geometry. This eliminated the need for an entire mold set including equipment in manufacturing. Another workshop with development, manufacturing, quality and purchasing boosted product and process quality significantly. A critical eye was turned towards the process of applying sealing compound in the seal profile for installation. The outcome: a reduction in the equipment and a shortened cycle time.

With a wealth of experience in elastomer processing, Schnitzer Group can analyze complex production processes and identify potential for improvement.

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14kg rubber in the engine compartment and for seals

Cutting down on weight by

35%

Our tea may not have hibiscus, but our cars do!

The e-mobility sector specifically is increasing its reliance on lightweight construction and sustainable composite materials. For suitable components—primarily in the vehicle interior, for door and roof paneling and backrests—natural fiber reinforced PP materials (NFPP) are being used more and more frequently. These composites have a direct influence on the carbon footprint of manufacturing and recycling and even indirectly on that of the car's own energy consumption, since the cars are usually considerably lighter in weight than when



conventional materials are used. Natural fibers are preferred thanks to their affordable purchase price, their sustainability and the minimal energy required to process them. Taking all factors into account, they save up to 80% more energy than glass fiber reinforced plastics (GRP).

Manufacturing NFPP normally involves using a mixture of various natural fibers from flax, hemp and/or kenaf (hibiscus) and combining them with PP melt fibers. There is much to consider when processing natural fibers: Starting in the development process, the shrinkage behavior of the plant material must be taken into account when defining tolerances. During subsequent processing, the required follow-up processes and methods differ from those used for pure plastic components, for instance. Furthermore, when



Coronavirus-related travel restrictions are placing increasing strain on supply chains. However, Schnitzer Group customers have an advantage „Made in Germany“ here. They benefit from our internationally

Does international character count as innovation? It certainly does during the COVID-19 crisis!

interconnected and networked team of experienced technology experts who have their head in the game at all times. To ensure efficient support in an international context, locations in the USA, China, Switzerland, Italy as well as three in Germany are ready to serve you. They offer critically important success factors: fast, efficient connections with customers and suppliers in the respective country, market expertise in the supplier and global sourcing field, detailed knowledge of local business

customs and economic regulations, and personal relationships in the respective location. Schnitzer Group is a family-owned company with 50 project engineers around the world. As the only company of this size in the market, it uses agile methods to find the fastest and most efficient route to project success

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Customer voice: Salanit – A cement factory wants to go CLEAN!

The Salanit cement factory in Slovenia has been a Schnitzer Group customer for a number of years. In addition to the technical and organizational management of extensive investment projects, the main focus of the collaboration is currently on strategic consultation for implementing the EU's Green Deal specifications. The shared goal is to implement carbon-neutral cement production by 2035. „By finding Schnitzer Group, we have gained a pragmatic partner to support us in handling the complex technical challenges involved in creating modern infrastructure. For our ambitious goal of establishing carbon-neutral cement production, Schnitzer Group is the ideal collaborative partner because of its high level of technical expertise and its intelligent and practical approach. We are confident that this strategic collaboration has laid the foundation for reaching our goal successfully,“ says Sven Bozic, Plant Manager at Salanit



Cement factory Salanit, Anhovo (Slovenia)

New addition to service portfolio: Cost Engineering



As part of a strategic partnership with startup IMORAN, we have added to our service portfolio. IMORAN's digital approach to product costing and optimization offers the right solution for a volatile project world where quick responses to changing scenarios are needed. Want more information?

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In the next edition:

88%

proportion of carbon dioxide in greenhouse gases

CO₂ reduction - disruptive thinking is in demand

2,6 million

pixels in a headlight
More safety. Guaranteed.

1/4

Less hassle with paint mist!

Amount of paint reduced

35%

less plastic with carbon fiber reinforced plastic

Fiber-reinforced composites - from prototype to series production

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