

IN TIME

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THE TRANSFORMATION FROM THE INDUSTRIAL AGE TO THE KNOWLEDGE AGE

The workplace world to which we were accustomed has seen fundamental changes in just a short time. New forms of collaboration using Internet platforms and cloud solutions require agile work methods. At the same time, development projects are becoming more multilayered and complex in terms of both content and organization. The need for largely remote management of projects for developing technical products is a notable reason for this. This is a particular challenge for the intensive interaction between OEMs and Tier 1 to Tier x suppliers. However the COVID-19 pandemic plays out, this trend will continue in order to meet carbon emission and cost targets.

Increasingly, the development of innovative products is blurring the boundaries between industries. This makes networking various disciplines an imperative. Companies that invest in new forms of collaboration at an early stage will be better able to withstand increasing competitive and innovative pressure in the medium to long term.


If teams are granted correspondingly greater leeway for decision-making and wider areas of responsibility, future projects will largely manage themselves. Specialized service providers play an important role here. Modern communication tools such as Microsoft Teams make it possible to



integrate them into projects quickly. This makes it possible to rapidly adapt specialized or personnel resources. In addition, service providers with specialized expertise further the innovation of the entire company, accelerating internal processes while keeping them lean and agile. Schnitzer Group has always insisted on a comprehensive approach in supporting technical development projects. Our bottom line: You cannot manage a project until you have gained a technical and organizational understanding of it. Our colleagues are usually called in on projects when there is an acute shortage of expertise or people. They quickly gain a complete overview of organizational, technical and qualitative risks as well as social aspects. If needed, you can benefit from our swarm principle with a global pool of 50 experts and comprehensive hands-on experience related to the industrialization of technical development projects.

In addition, by integrating locally available colleagues with generalist-type project knowledge and using smart assistance systems such as VR glasses, we also improve our customers' carbon balance. This enables us to get a picture of complex interrelationships and work on them with decentralized, organized teams in real time. Today, where once many specialist divisions were required to be present in person, we can take the entire project team on a virtual business trip.

Where needed, we can be integrated into a project anytime, anywhere to provide expertise and personnel reinforcement. We call this "The SYSTEMIC Upgrade for your engineering project," and it provides our customers with added value and a competitive advantage.


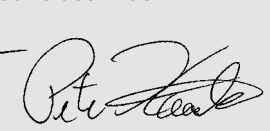
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Dear Readers,

While our mood was restrained at the beginning this year, now, at the end of the fourth quarter, we can be satisfied. Despite its challenges and changes, this will be a good year for us.

Carbon footprint, digitalization, stabilization of supply chains – these topics will continue to keep us very busy in 2022 and beyond. Schnitzer Group has laid the groundwork for this already. Reducing the carbon footprint – but how? Technical innovations are proposed as a means of bringing about solutions. It is critical to avoid going down the wrong path while arranging the technical approaches to arrive at a sustainable technical solution. Schnitzer Group is right in the midst of all this. Digitalization! If you think your smart home is the closest you'll get to the digital world, think again. We understand digitalization as the networking of a wide variety of processes that become faster, more efficient through digital intelligence, while using less energy. We collaborate with you in development. Supply chains: On the one hand, stabilization is necessary. The real challenge, however, is a sustainable, long-term strategic realignment of the entire purchasing side. The old formulas and methods don't work any more. To survive, you need new and creative approaches. We like to break with traditions. Put your trust in us!

 
Peter Schnitzer Peter Kienzle

CFRP in mass production:

A sedan that drives like a racecar?

Independent of the drive technology, we are continuously developing more lightweight vehicle structures to minimize the mass to be moved. These applications increasingly



use CFRP, not only because of its unbeatable coefficient of mass, but also due to its reputation as a „miracle material“. Today's racecars would be impossible without CFRP. Racecar materials from mass-produced vehicles are a concept with a “wow” factor that makes a marketing pro's heart beat a little faster. Let's be honest: A little CFRP makes even my mass-produced vehicle into a little racecar. Or at least makes it seem like one. Worlds are colliding as the mass-production world of the OEMs meets the CFRP supply

chain, which is primarily oriented towards auto racing. Understandably, a common phrase in the racing world is “We'll make it work!” The task is to equip a handful of cars that are not driven on public roads. However, different principles and constraints apply to mass production. There simply is no time for making a part fit – it has to work from the get-go. Moreover, because the vehicle is being driven on public roadways, it requires official approval of its roadworthiness. Each and every part is subject to a documented approval process that decides the final approval of the individual part and, ultimately, of the vehicle as a whole. The statutory requirements – a minor concern in auto racing – are key to project success in large-scale vehicle production. Compared to racing, the series OEM and its supply chain are subject to a substantially greater amount of testing and documentation, to which rejection is frequently the first response. The risks associated with a lack of safeguarding and documentation increase the willingness of all concerned to have this CFRP process put on a professional footing. Step by step, Schnitzer Group's pragmatic solution approach guides CFRP supply chains into a low-risk supply situation compatible with mass production. Get in touch with us. wolfgang.strotmann@schnitzer-group.com

1 Million pixels in the headlight

Greater safety, comfort, convenience and design



In many respects, the automobile is undergoing a reinvention. E-mobility, the use of artificial intelligence and different usage patterns on the part of customers are important aspects. However, this also includes innovations in lighting systems – in current vehicles, these are perceived directly and indirectly by end customers. In addition to greater safety, comfort and convenience, intelligent lighting systems also open up new possibilities in product design. As a result, even today, lights are already being called the “signature of the vehicle”. It takes correspondingly high priority in the development of the vehicle and design.

Many innovations have followed the triumph of the LED. State-of-the-art lighting systems work with numerous sensors, cameras and control units. The objective here is to detect as many details of the vehicle's surroundings as possible and illuminate the driver's field of vision in the best possible manner without blinding other motorists. Another pluspoint, compared to conventional light sources, LED technology offers energy saving potential – especially relevant for e-cars. The current state of development is lighting systems with up to one million pixels per headlight. This opens up new application fields. For example, it is possible to pinpoint pedestrians on the shoulder of the road using lighting. The headlight can also give advance notice of traffic situations using symbols. All of this is beneficial to general traffic safety. The grand task for development is the electromechanical integration of the new lighting technology into the available design space. While doing so, both high-end design requests and approval-related requirements must be taken into account. Each generation of headlights brings new challenges to be mastered. For many years, Schnitzer Group has been a partner in developing and industrializing lighting systems for OEMs and Tier1 suppliers. Questions? hubert.sinz@schnitzer-group.com

88%

**carbon dioxide content of greenhouse gases
CO₂ reduction - disruptive thinking is called for**

When we think about CO₂ reduction these days, our minds tend to go straight to reducing harmful automotive vehicle drivetrain emissions. In the future, however, carbon neutrality will also be examined as part of vehicle manufacturing. In the era of decarbonization – the process of moving away from carbon, particularly in the energy sector – all production processes are under intense scrutiny. The (theoretical) goal is a carbon-free economy. The future of the supply chain must be green. The objective is to replace carbon-intensive processes with low-carbon ones. In the near term, global sourcing will consider a supplier's car-

bon balance as a major selection criterion in addition to price and quality. Of course, the specifics will depend on the company's forward-looking, environmentally aware purchasing policies. This means that even today, suppliers must think about how they will plan and implement their own production to be more carbon neutral. Which type of energy do we use? How and where is this energy produced? What happens to our waste heat? How can we recycle this waste heat? For example, an injection molding plant has a high energy input, using a great deal of energy for melting the granulate and a lot of force for molding. Then full throttle again for the cooling-down process. The status quo method “burns off” this energy through the chimney! Together we can set up concepts for making your production and supply chain more sustainable. At Schnitzer Group, we have this expertise in-house. Your contact: peter.schnitzer@schnitzer-group.com



35%

**fuel savings with CFRP:
From prototype to series production - feasible?**

Due to the increasingly stringent emission requirements, automakers are required to minimize the gas consumption of the fleet. Weight reduction is a critical factor in this regard. Therefore, carbon-fiber reinforced plastic (CFRP) is becoming more important all the time, including for mass-produced products. CFRP is half the weight of steel, one-third lighter than aluminum and more rigid than most metals, while also being corrosion-resistant. However, CFRP products have significantly higher raw material costs compared to steel and alumi-

num. Achieving the finished product also requires highly elaborate manufacturing processes that are also prone to error. This means high production costs. As a result, the forward-looking properties of CFRP materials had been reserved exclusively for aerospace engineering applications and short runs.

Because of the increasing demand for CFRP products from various branches of industry, it is now necessary to cut costs and scale up the complex manufacturing processes for mass production. The current priorities are further reducing the cycle times (which are still very high), manual labor steps and the amount of rework needed. Implementation requires high investments in innovative automation engineering. The physical properties of the semifinished products used are limiting factors. For example, the curing speed of the resin has a critical effect on the cycle. The compo-

More than 200 plastics exist -

yet there are shortages of many types- delivery bottlenecks: Shortages in the plastics sector

For a long time now, certain substrates have been unavailable on the European plastics market. This currently affects the area of ABS plastics, while last year it was polyamides. Insufficient imports from the Far East are one of the reasons for this. European-produced supplies have been inadequate, a situation that has been made even worse recently by plant maintenance and an instance of force majeure. Processors are struggling with allocations. In many cases, the only way out of this dilemma is to substitute the material used with an alternative available material within the material group. However, the scarcity-related difficulties of such a substitution were not limited to just procurement adequate qualities. They also extended to the necessary and prescribed downstream processes. Special samplings of the components in the new material must be planned and, where applicable, go through extensive



product validations. Delineations between batches must be planned and documented. For good measure, the product has to undergo the sampling process again – all of which requires a great deal of additional labor and expense. This phase is where Schnitzer Group specialists enter the picture. We are familiar with both the raw materials market and the processes necessary to safeguard capacities in the prescribed quality. This enables our team to provide support in this process from the point at which any necessary alternative procurement is identified. Our portfolio also includes taking on some of the workload and using our years of practical experience during sampling at the machine for production of the parts as well for advance quality planning processes. The focus is always on safeguarding the supply to the greatest extent possible, paired with compliance with the applicable product-specific quality guidelines. Is there something we can take care of for your business? klaus.roessler@schnitzer-group.com

ments for prototype or short-run production (100 to 1,000 pieces) are, for the most part, manufactured in a manual or partially automated process. To make the use of CFRP profitable for mass production, it is necessary to configure manufacturing processes in partially or fully automated linked systems and with flexible production facilities in order to adapt the production cells for subsequent projects or components. The competitiveness compared to metal materials will continue to increase along with the degree of industrialization of CFRP production. If we consider the overall environmental balance or the lifetime savings potential due to factors including the lower weight of a vehicle, the break-even point compared to conventional materials is reached quickly.

The CFRP scene is dominated by high-tech manufacturers. Working in an adept and agile style, these teams conjure up the perfect component for any requirement. At the OEMs in particular, the agile teams of technical “freaks and geeks” now encounter cookie-cutter large-scale organizations that do not know what to make of the statement „We'll get it done!“ This requires an interface coordinator and moderator capable of “wedding” two organizations with completely different cultures for the sake of the end product. Schnitzer Group has made a name for itself across industries in the CFRP area in the last decade. peter.schnitzer@schnitzer-group.com


Schnitzer Group USA expanding again!



Our “SYSTEMIC Upgrade” method integrates, for example, the collaboration of all locations of the Schnitzer Group and other international external employees. Our advantage “Made in Germany” plays out here. Global collaboration with a core German team of experienced technology experts who have their head in the game at all times. Our customers value this global connection of the Schnitzer Group companies in the United States, China, Switzerland and Italy. Precisely in times like these, such collaboration is a key factor for success. For example, Schnitzer Group colleagues from Germany and the US are simultaneously offering support to an international customer in the field of decorative plastic parts. In technical project management, this involves blower nozzles and decoration strips in the interior. The international orientation of Schnitzer Group and a targeted flow of information to all stakeholders guarantees high added value among our satisfied contacts. In addition, we were hired to implement a quality system with PPAP in a major truck project. Project management in engineering as well as plant and line management

to increase the output quantity complete the interesting project from the trucking world. The agile US team has already been working on the long-term project with a Schnitzer Group interim manager in the maintenance division for years. The customer is a European Tier 1 supplier in the punched parts/welding technology field. We worked with the customer to develop, elaborate and implement a spare part strategy with cost savings.

The NAFTA zone is now becoming a very important market for the automotive industry. Our staff in Charlotte, headed by CEO Robert Fällner (who headed Schnitzer Shanghai for many years), is experiencing continuous growth. Our new colleague, Nicholas Giffel, has been lending his hands-on expertise to the American team for about five months.

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Voice of the Customer:

Phoenix Contact E-Mobility

For three years now, the successful partnership and collaboration between Phoenix Contact E-Mobility and Schnitzer Group has

been in place. As an external partner in the Industrial Engineering department, Schnitzer Group provides support in all technical matters related to injection molding of plastics and to moldmaking. Throughout the entire product creation process, Schnitzer Group colleagues are on hand to provide their expertise in plastics-optimized production part design, drawing evaluation, mold and tooling concepts, analyses of filling studies and DFMs. To safeguard the degree of readiness for industrialization, Phoenix Contact E-Mobility also relies on the hands-on experience of the Schnitzer team in ramp-up management. The global network of expert Schnitzer team colleagues around the world, whether in injection molding manufacturing or moldmaking, and in-depth understanding of OEM processes have already made it possible to see several ramp-up projects through to their goal.

As part of an in-house training session held at the location in Schieder-Schwalenberg, Germany, the team of Schnitzer Group experts imparted valuable insights in moldmaking and the injection molding process to ten interested employees of the Industrial Engineering department at Phoenix Contact E-Mobility.


„My team was particularly impressed by the product-related approach and many practical tips for everyday work. The colle-



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agues were able to turn right around and apply what they learned at the machine immediately. That provided significant added value for all the colleagues,” said Mr. Andreas Braun, Manager Industrial Engineering Operations at Phoenix Contact E-Mobility.

Phoenix Contact E-Mobility GmbH is the competence center for E-Mobility charging technology within the Phoenix Contact Group – a global market leader in industrial automation and electrical engineering. The IATF-certified subsidiary with over 450 employees offers a wide component portfolio for the high-growth E-Mobility market – for the vehicle-side charging interface as well as for the charging infrastructure. In collaboration with customers and partners such as Schnitzer Group and in combination with other components of the Phoenix Contact Group, the end result is networked complete solutions for environmentally friendly, sustainable mobility.

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LEO PALMA

– a mechanical engineer knows no boundaries!

Leo Palma has been working in technical project management at the Schnitzer Group since 2016. Prior to his studies in mechanical engineering, he completed a training as an IT management assistant. Mr. Palma has a strong affinity for technology, coupled with a very positive charisma, high empathy and communicational skills.

You have already spent several months on the road for the Schnitzer Group in the NAFTA area and now China? What attracts you to Asia?

At the Schnitzer Group, there is a high degree of flexibility in the daily work and, of course, also in projects. That makes everyday life exciting. Personally, I have always been a fan of Asia and seized the opportunity to spend a semester abroad in Thailand during my studies. When I was approached by an internal job offer at Schnitzer Consulting Shanghai in 2019, I applied the same day for the assignment in China. Two months later I was in Shanghai.

In which countries have you worked for the Schnitzer Group up to that point? Is there a favorite country?

I have been fortunate enough to manage many international projects. Within Europe, I was able to gain technical project experience in Switzerland, Austria, Poland, the Netherlands and Slovenia. After an eight month long project assignment in Mexico, I was inclined to continue working in the NAFTA area. Since my move, it is clear that China, where I live and work since 2019, is my favorite.

What was/is your highlight in Shanghai?

It is the internationality, the flair of the big city and the flow of the metropolis with its millions of inhabitants that can be felt here every day. You live and work in a melting pot of cultures. It is an absolute highlight to see how nations, people, languages develop in parallel and only being human counts, no matter what skin color, origin or religion. The term cosmopolitan is totally appropriate here. And of course I am attracted by the food, which could not be more diverse. From the very beginning, the appreciative exchange with Andreas Kohler, CEO of Schnitzer Consulting Shanghai Co., Ltd., was also a gain.

Which experiences can no longer be taken away from you?

I really enjoy knowing the most diverse living and working conditions in the most different countries. Unique impressions and experiences that I gain in a wide variety of customer projects also broaden my horizon


and are part of a good life for me.

What do you value most about the Schnitzer Group?

Openness, appreciation, and trust! These qualities are practiced values at the Schnitzer Group. I would say they are unique. I was always able to coordinate personal development directly with the management and define a common path, so that always a win-win situation could be achieved. Technical hands-on experience, which expands with every project. You can make an impact in the projects and achieve a lot. The close cooperation with colleagues in international projects shows again and again how swarm intelligence is actively practiced. And variety: One time I handle an injection molding project, then I get a project with a focus on metal forming or carbon. Then there are topics with headlights, then another project with air intake grilles or injection nozzles. It's the technical and human challenges in projects that never get boring.

The Schnitzer Group has many experts in a wide variety of fields, how does that work?

Due to more than 30 years of expertise, the Schnitzer Group team includes many colleagues with in-depth expert knowledge. For example, we have experts in quality, metal forming, injection molding, tooling and mechanical engineering, carbon technology, light & vision. Our customers have a central contact person (one face to the customer) and a whole team of experts in the background.

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