

COMFORT SAFETY EFFICIENCY



Mobility is becoming more electric, autonomous and connected. Brose is creating new ways to experience mobility with intelligent solutions for vehicle access and interiors and with innovative electric drives.

Our mechatronic systems are becoming more and more connected and work hand in hand with sensor technology and software for more comfort, safety and efficiency in all types of vehicles.

Future Brose – the largest renewal program in the over 110-year history of our family-owned company – will make our products even more competitive and assure their quality. As a lean organization that fosters entrepreneurship, Brose is ready to take on the challenges of the future.

Cover image:

In 2019 Brose achieved the highest total turnover per vehicle sold with the Mercedes GLS. The latest model introduced in 2019 features our power and manual seat structures in the first to third row. We also supply power head-rests and door modules for this luxury SUV.

AT A GLANCE

€6.2

billion in turnover

26,019

Employees

64

Locations

24

Countries

9.1

% of turnover
invested in research
and development

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COURAGE, SPEED AND CLARITY

New CEO, streamlined organization, expanded skills.

Brose is increasing its competitiveness and helping shape new mobility experiences.

Michael Stoschek, Chairman of the Brose Group, has a clear message.



“Our Future Brose program is designed to bring back the characteristics that were the reason for our extraordinary success and growth in the first place: a focus on the essentials, direct contact between management and employees, fast decision-making and more responsibility throughout the ranks.”

MICHAEL STOSCHEK
Chairman of the Brose Group

This isn't the first time Brose has experienced turbulent times in its over 110-year history. How can our family-owned company use this to its advantage today?

Michael Stoschek Under the leadership of company founder Max Brose, our company survived two world wars and the Great Depression; the 1973 oil crisis and the 2008 financial crisis hit during my tenure. Sales fell sharply each time and we had to dramatically cut our production output. Nevertheless, the solid financial situation of our family-owned company without bank loans helped us make it through these difficulties times – and things will be the same this time, too.

You want to see more entrepreneurship at Brose again. Can you explain?

Michael Stoschek The downside of our growth over the past 15 years has been more hierarchy, more bureaucracy, less entrepreneurial spirit and even less focus on cost-effectiveness. I am convinced that we will see more pragmatism and quick, economic decision-making at all levels again under the leadership of Ulrich Schrickel. He will also flatten hierarchies and expand the manager-to-staff ratio. This will give employees and managers more authority.

How can this approach based on Max Brose's way of working be fostered among employees?

Michael Stoschek Max Brose was a pragmatist who cared about all of his employees. He spoke to them every day in administration and production and listened to their suggestions, but he also paid attention to their concerns and needs. I think that it is just as important today for our managers to seek out direct contact with employees throughout the ranks so that they can be seen as role models.

What does this mean for the corporate culture at Brose?

Michael Stoschek I'm glad this term is in focus again. It is up to the shareholders and executive management board to make it as clear as possible to our approximately 26,000 employees what kind of conduct they expect from managers and staff. This includes an open dialog about which objectives have been achieved and which ones have not. In any case, our shareholders would like to see the same company spirit of the past carried forward into the future so that the high motivation of our employees will also lead to extraordinary success. Openness to new ideas, motivation, honesty, but also total transparency when dealing with problems are intergenerational values that our shareholders want to see in place at all company locations.

You withdrew from operations 15 years ago and have been active as Chairman of the Brose Group ever since. What opportunities does the transformation offer Brose?

Michael Stoschek As the name indicates, the purpose of our Future Brose program is to secure the continued extraordinary success of our company for the next generation and ensure that every employee is proud of this. Digitization and the elimination of unnecessary tasks will improve efficiency and decision-making speed. At the same time, we will improve the quality of our products and increase the customer benefits.

Hundreds of employees around the world are involved in the implementation of the program; a number of external companies are also supporting us in these efforts. Our company is investing some 500 million euros in this comprehensive renewal program, which will ultimately save us the same amount every year thanks to advanced products and improved workflows. Every employee must do their part to ensure that Future Brose is a success and thus contribute to the long-term future of our company.

MISSION: THE FUTURE.

**“Brose’s competence in mecha-
tronics is the foundation for
intelligent applications.
Sensor technology and software will
provide the necessary intelligence
and networking capability of our
products in the future.”**

ULRICH SCHRICKEL
CEO of the Brose Group

Ulrich Schrickel joined Brose in early August 2019 as head of the Exterior business division; he was appointed the new CEO effective 1 January 2020. He has a degree in mechanical engineering and held various leadership positions at Robert Bosch GmbH in Germany and abroad, most recently as Executive Vice President Automotive Electronics. He brings many years of management experience and extensive knowledge in electronics and digitization to Brose.

His mission is to lead Brose into the future as an independent company, strengthen the company’s economic efficiency and power to innovate, and create a culture of entrepreneurship throughout the organization with the Future Brose program. These are the shared objectives of the shareholders, executive vice presidents and advisory board.

ULRICH SCHRICKEL:

“Brose has been actively shaping advances in the automotive industry for over 110 years. And we want to continue to do so in the future. The mobility transformation has never been as profound and significant as what we are currently experiencing: we are seeing greater hybridization of the powertrain – and it is even becoming completely electric in some cases. Autonomous driving is shifting customer requirements, while the electronics architecture in vehicles is undergoing fundamental change. Individual control units are merging into powerful modules that integrate various control tasks. Digital connectivity is making these developments possible – and accelerating them.

Brose is ideally positioned to successfully convert its traditional portfolio of mechatronic products for the digital future. Our strategy is clear: we are adding expertise in sensor technology and software to our competence in mechatronics. Shared mobility and autonomous driving will be more comfortable, safer and more efficient thanks to Brose.

In addition to this technical renewal and expansion, we will also continue to advance the way we work together. We must take a critical look and accept the fact that our organization and orientation no lon-



ger meet the needs of the market and customers. In many areas we are too slow. An organization divided into many different focus areas prevents entrepreneurship. We will therefore make our processes and collaboration more efficient by reducing hierarchies, expanding the manager-to-staff ratio and eliminating red tape. We are also investing in digitization and automation of administrative workflows, for example with IT platforms and software robots in Human Resources, Purchasing and Controlling. For all of these changes we are relying on flexible, efficient and entrepreneurially minded employees.

We launched the Future Brose program in order to take an integrated approach to the various issues. This will strengthen our power to innovate and increase our competitiveness so that we can achieve the necessary growth. The ownership structure, which guarantees continuity, and the financial stability of Brose are things that I appreciate very much as the new CEO. They provide long-term guidance, also on how to lead the company. I would like to thank my predecessor Kurt Sauernheimer for his professionalism and trust during the integration process. I look forward to tackling the challenging tasks together with the shareholders, advisory board, executive management board and employees of Brose. Our objective is clear: we want to be ‘best in class’ in quality, innovation and efficiency.”



THE EXECUTIVE MANAGEMENT BOARD (FROM LEFT):

PERIKLIS NASSIOS
Purchasing

SANDRO SCHARLIBBE
Interior

CHRISTOF VOLLKOMMER
Exterior

ULRICH SCHRICKEL
CEO

NIKLAS BEYES
Commercial Administration

THOMAS SPANGLER
Production

RAYMOND MUTZ
Drives



“Brose is already looking into the potential of software-based future technologies. Putting this into practice swiftly and systematically is what counts now.”

PROF. DR.-ING. THOMAS WEBER
Member of the Advisory Board

SHAREHOLDERS

MICHAEL STOSCHEK
Chairman

JULIA STOSCHEK

MAXIMILIAN STOSCHEK

CHRISTINE VOLKMANN

GABRIELE VOLKMANN

ADVISORY BOARD MEMBERS

FRANZ-JOSEF KORTÜM
Chairman

PROF. DR.-ING. THOMAS WEBER

PROF. DR. ANDREAS WIEDEMANN

EQUAL PARTNERS

130 automotive manufacturers and more than 40 suppliers rely on Brose's products and services. We supply mechatronic systems and electric drives to our customers for a wide variety of mobility applications.

130

MANUFACTURERS



40

SUPPLIERS





“Brose wants to offer solutions for everything that moves inside or around vehicles. We are able to do this through the intelligent integration of our products so that time spent inside a car becomes an experience.”

SANDRO SCHARLIBBE
Executive Vice President Interior

Where does Brose stand when it comes to the future of mobility?

Sandro Scharlibbe We develop innovative reclining seats and multifunctional center consoles across the globe for flexible vehicle interiors. A driving service in the United States recently presented a self-driving SUV with side doors that close automatically using our drive. In the future, we want to play a key role in how people and goods enter and exit a means of transport and how they can be moved safely and comfortably. We will also offer thermal management solutions. Our cooling fans control airflow into the vehicle, electric air conditioning compressors ensure the perfect climate and intelligent actuators in the cockpit control airflow in the vehicle interior. Overall, there are many interesting, albeit challenging growth segments.

Why do customers choose Brose as a cooperation partner?

Sandro Scharlibbe Brose stands for financial stability, long-term orientation and innovative products. These are key success factors in times of technological change and global political and economic turmoil. We have a global production and development network with proximity to our customers. This enables us to respond to local requirements while also implementing worldwide platform projects.

What is important in this challenging environment?

Sandro Scharlibbe The competition is getting tougher, both technically and economically. In addition to excellent product solutions in the different business divisions, sensors and software will make

a much greater contribution in the future to intelligent connectivity of individual Brose components – especially when we offer cross-system solutions tailored to the customer experience.

What does this mean specifically for development activities at Brose?

Sandro Scharlibbe Our core business is just as important as ever and will continue to be the backbone of our business going forward. We are also working with customers on solutions for changing urban mobility and flexible adaptation of the vehicle interior for variable usage and autonomous driving scenarios. For example, we are combining the expertise of our business divisions to implement novel vehicle access solutions by connecting and synchronizing our components. Our Drives business division will also play an important role in vehicle electrification in areas such as range optimization through efficient thermal management.

Brose enters collaborative partnerships for this purpose. Why?

Sandro Scharlibbe To compete against global technology companies we need additional skills, broader system expertise and speed. That's why we also collaborate with partners in specifically defined areas as part of strategic alliances. Complete seats is one such area – or new access systems for driverless passenger vans and highly integrated concepts for lightweight doors. Beyond this, we have established partnerships for sensor solutions, new materials and production processes.

EYE ON BUSINESS

These were the focus topics of the three business divisions in 2019.

€3.1

billion in turnover



Brose door systems integrate all key functions from latch to drive on a single carrier plate. This cuts weight and costs while simplifying assembly processes.

EXTERIOR

Last year the Exterior business division produced around 30 million door systems, 9 million liftgate drives, 42 million window regulators and 18 million side door closure systems, generating approximately half of Brose's turnover. Thanks to new customers in North America and Asia, we kept our leading position in door modules and liftgate systems. Latch system production volumes should nearly double through the strategic expansion of our customer portfolio. Production of the new Brose lightweight latches started in Europe and Asia in 2019. Industrialization will follow in India and Mexico.

The first 100% electric sliding door latch also entered series production. Opening and closing is now completely electric without the use of a mechanical lever chain; in case of an accident, the integrated crash sensor sends a signal to the closure system, which establishes an emergency mechanical connection to the door handle. This also makes it possible to open the door if there is a power outage. The lower number of components makes the system even more robust and cost effective. We expect the demand for power latch systems to continue to grow in the coming years and are already investing in the development of these concepts.

€2.0

billion in turnover

INTERIOR

Brose supplies more than 11 million front and rear seat structures to car manufacturers every year. The Interior business division added vehicle comfort features to its product portfolio in 2019, for example with the start of production of electronically controlled massage systems used in different models of a premium manufacturer or the next generation of weight-optimized lumbar supports. Brose has also launched series production of modern adjustment systems for rear seat backs, storage areas in center consoles and padded headrests. Floor-integrated adjustment systems for passenger vans and SUVs are already market ready, as are electronically commutated motors for seat adjusters, reclining seats and interior sensors.

For the first time, our Chinese employees have developed their own complete seat structure to meet the specific demands of the Asian market. They came up with a design in record time, with solutions for both manual and power seat adjusters. The scalable front seat structure can be implemented in a variety of vehicle environments and features a flexible assembly concept. Procurement of materials and

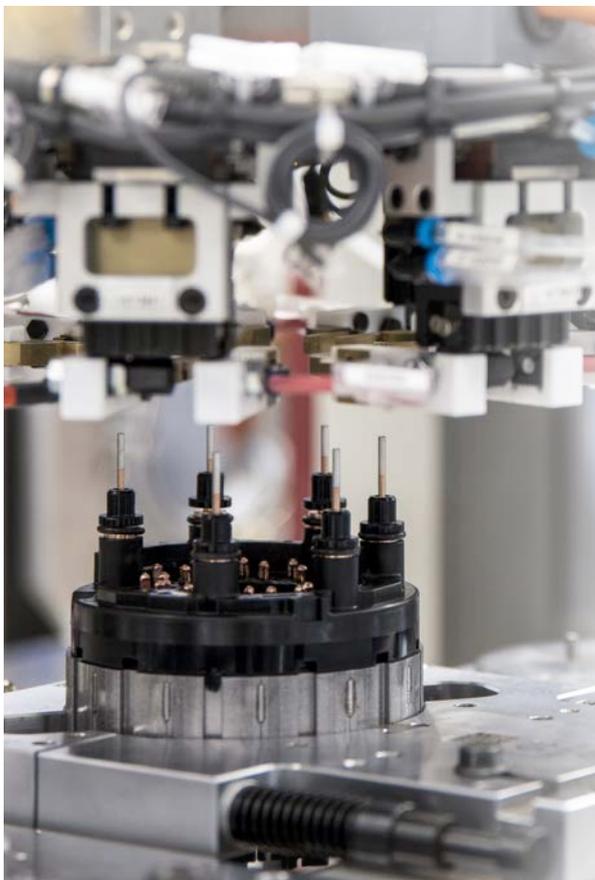


In China, a very flexible seat design was developed specifically for use in the local market.

components takes place in the local market, significantly lowering production costs in the process. Brose has already received orders for over 4.5 million seat structures.

€1.1

billion in turnover



Brose's modular motor system offers standardized components and interfaces for all types of drives.

DRIVES

In 2019 the Drives business division supplied some 40 million motors and drives to 10 carmakers and 38 suppliers. Brose took a leading position in this segment with the production of 7 million electronically commutated cooling fan modules. The focus was on competitiveness, growth and quality. The aim is to achieve market leadership by 2023.

That is why we established a new development and production location in Pančevo near Belgrade, Serbia. Brose will initially start production of drives and electronic systems for cooling fans there in 2021. The business division is exploiting additional potential for the core business and securing its growth objectives with these efforts. The successful acquisition of over 300 million euros in turnover per year in 2019 is proof that this strategic move is working.

At the same time, Brose is investing heavily in new development-intensive products such as the electric air conditioning compressor and oil pumps for modern transmission applications. Series production of the compressor for the European market is already starting in 2020. This will expand Brose's expertise in the field of thermal management, a growth segment with long-term potential.

Quality and competitiveness are also key factors for e-bike drives. Brose established a service department for bicycle dealers and is becoming a provider of complete systems with its drives, batteries and displays. We adhere to the same quality standards for the production of bicycle drives as in the automotive industry.

WORLDWIDE CUSTOMER PROXIMITY

- Production sites
- Joint ventures
- Headquarters
- ≡ Development/sales offices



“Brose innovations respond to the demands of the regional automotive market. As an employer, we promote employees and young talent with our award-winning apprenticeship program.”

WILM UHLENBECKER
President Brose North America

America
turnover: €1.925 billion
employees: 6,503

- London
- Querétaro Aeropuerto
- Querétaro Benito Juárez
- Querétaro El Marqués
- Puebla
- Belvidere
- Detroit
- Jefferson
- New Boston
- ≡ Silicon Valley
- Spartanburg
- Tuscaloosa

Europe/RoW
turnover: €3.040 billion
employees: 15,674

- ≡ Belgrade
- Bratislava
- Brits
- Coventry
- Curitiba
- East London
- Ghent
- Goiana
- Gothenburg
- Istanbul
- Kecskemét
- Melfi
- Ostrava
- ≡ Paris
- Prievidza
- Rožnov
- São Paulo
- Sta. Margarida
- Togliatti
- Tondela
- ≡ Turin



5
continents

24
Countries



“Brose has 20 years of experience and a 40 percent market share for door systems in Brazil. We will continue to grow here as part of a strong global development and production network.”

MAX FORTE
President Brose Brazil

Germany

- ● Bamberg/Hallstadt
- Berlin
- Bremen
- ● Coburg
- ≡ Ingolstadt
- Kitzingen
- Meerane
- ≡ Munich
- ≡ Oldenburg
- Rastatt
- ≡ Sindelfingen
- ≡ Wolfsburg
- ● Würzburg
- ≡ Wuppertal



“We have enjoyed high recognition in China since we entered the market in 1996. Focusing on technology and quality, the strengths of different cultures and the right partnerships solidify our market leadership.”

JIE XIANG
President Brose China

64 Locations

“There are two main things that we are known for in Asia: our expertise as a German supplier for luxury car brands and our ability to offer highly integrated technologies in the area of mechatronic components.”

OLIVIER FIDRY
President Brose East Asia



Asia

Turnover: €1.205 billion
Employees: 3,842

- Changchun
- Chongqing
- Guangzhou
- Beijing
- ● Shanghai (SHA, SHN)
- Shanghai (SBA)
- Shanghai (SHM)
- Shenyang
- Taicang
- Wuhan
- ≡ Pune
- ≡ Nagoya
- ≡ Utsunomiya
- ≡ Yokohama
- Incheon
- ≡ Suwon
- Rayong



“We offer Indian carmakers technologies based on global quality standards. We are an important partner for the group in the area of IT services and development.”

VASANTH KAMATH
President Brose India

EVERYTHING IN MOTION

More comfort, safety and efficiency – the requirements of mobility are constantly evolving. Driven by innovation, our world and the way we get around is changing. Mobility will be more customized in the future. Brose is already developing connected and intelligent systems for new driving experiences.

TODAY → TOMORROW → BEYOND

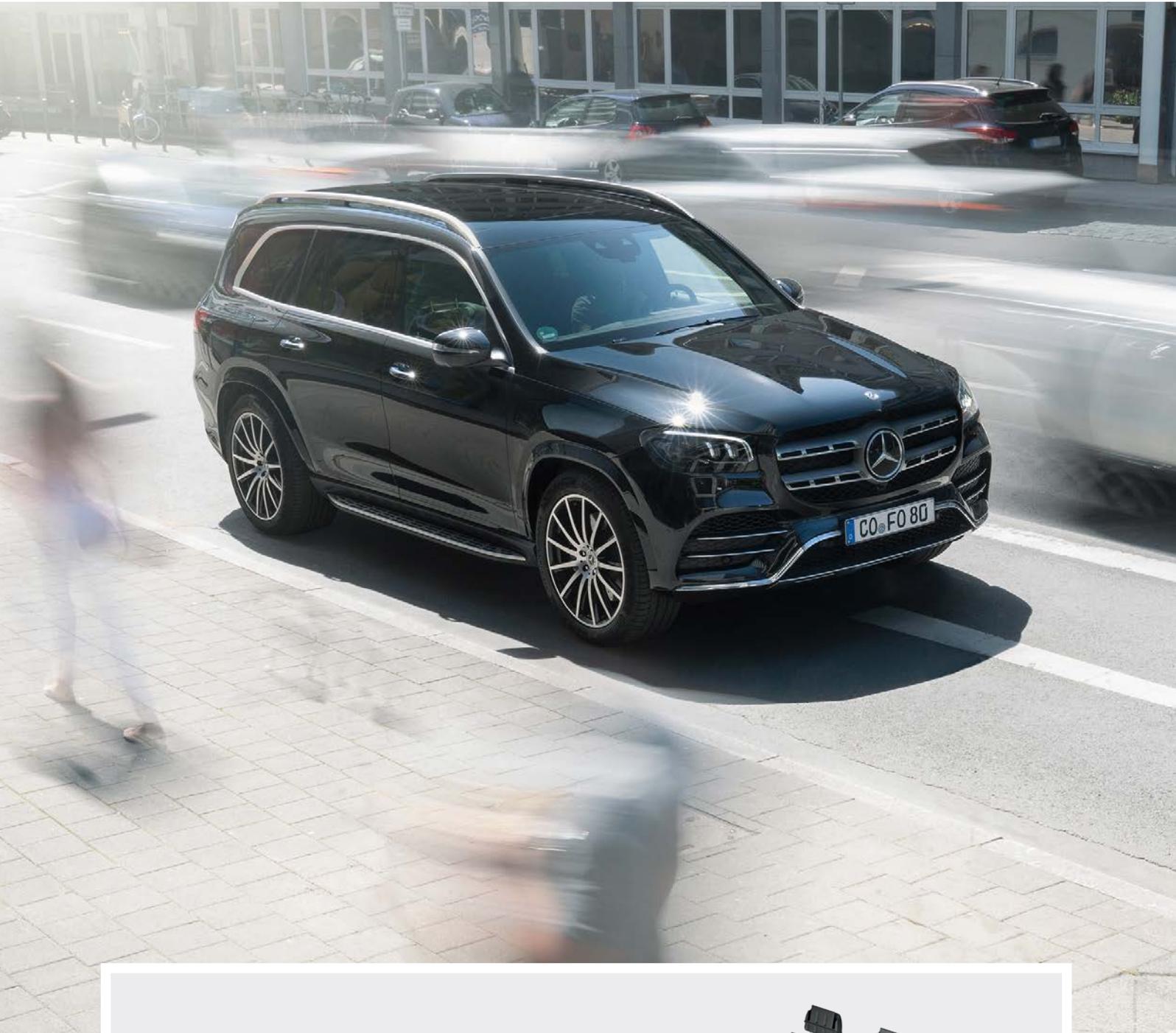
People want to decide for themselves when, how and where they move. To get from point A to point B and back again comfortably and independently, the automobile will continue to be the most individual means of transportation. No matter where in the world a car door or window is opened, a car seat adjusted or the air conditioning turned on – you will almost always find Brose products in use, even though the occupants usually can't see them.

1 Brose offers a new level of comfort for vehicle entry and exit with the power side door drive. What's a convenience today will be a necessity for autonomous driving and car sharing tomorrow: if a passenger fails to close the door properly, the vehicle must be able to do this itself before driving off.

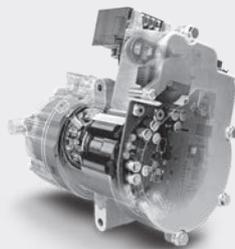
2 Brose's electric air conditioning compressor is extremely efficient. Unlike conventional versions powered by an internal combustion engine, it heats and cools the interior only when needed. This significantly increases the range, especially in hybrid and electric vehicles.

3 Sometimes you need more seats, other times maximum cargo space. Brose has electrified all seat rows for simple and flexible adaptation of the vehicle interior. What's more, a load-through made of continuous-fiber-reinforced thermoplastics saves up to 1.5 kilograms of weight.





1
**Power side
door drive**



2
**Electric air conditioning
compressor**



3
**Electrified
seat rows**

TODAY → TOMORROW → BEYOND

Projections greet the driver, a gesture opens the door of the vehicle. At the same time, the side bolster lowers for more convenient boarding. With a touch of a button, the passenger can decide how he or she wants to enjoy the ride. The interior adapts to the desired usage scenario: electronically controlled seats, screens and storage areas automatically coordinate their positions and the flow of air from the AC system adjusts accordingly. Thanks to Brose, this future vision will already be available in the next generation of vehicles.

1 Using visual cues, Brose is picking up on the trend for direct communication between the driver and car, e.g. with gesture control. This allows for greater customization and fast identification of the vehicle, for example in car sharing applications. Our access system even features sensors that detect obstacles when opening and closing and reliably stop the door before a collision occurs.

2 Through collaborative partnerships Brose is expanding its expertise to include the development and production of complete seats. Ergonomically designed seat adjusters, systematic lightweight construction along with seat covers made of recycled plastics and renewable materials prove that design and comfort can also be sustainable. Car occupants can enjoy comfortable sitting and even reclining positions thanks to the versatile headrest, armrests and leg rests. An integrated belt system ensures safety.

3 The greater the flexibility inside the vehicle, the more important the system for reliable interior monitoring. Radar sensors detect which seats are occupied and whether there is sufficient space for the reclining function. The precision system detects heartbeats and breathing and gives a warning if children or pets are still inside the vehicle when it closes. The electronic control unit can return the seat to a safe position even before an accident occurs and the airbags are released.





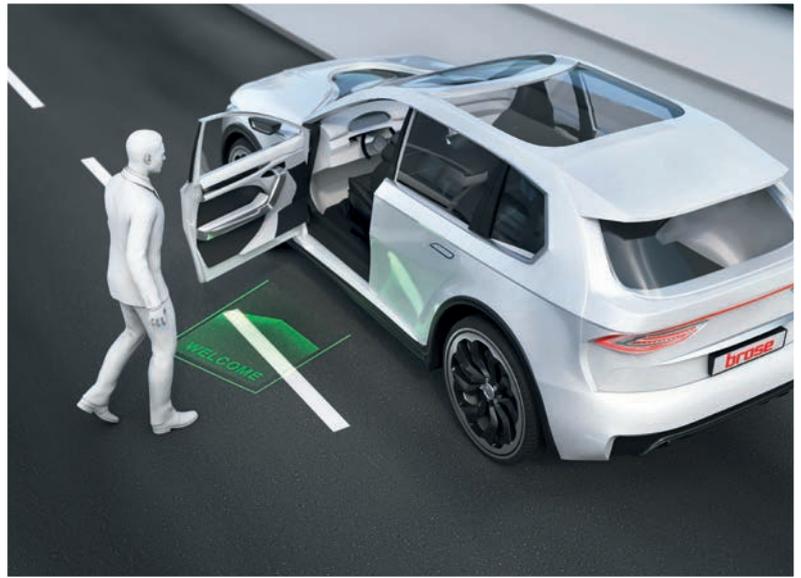
2
**Flexible
seat design**



1
**Intelligent
vehicle access**



3
**Sensor-based
interior control**



1 Boarding

TODAY → TOMORROW → BEYOND

Whether intelligent, self-navigating shuttle buses, robotaxis or autonomous, connected and electrified vehicles – new interior concepts make it possible to work, relax or be entertained while driving. Brose is connecting its systems for vehicle access, interior and thermal management to offer solutions for innovative usage scenarios inside cars, no matter what type of powertrain.

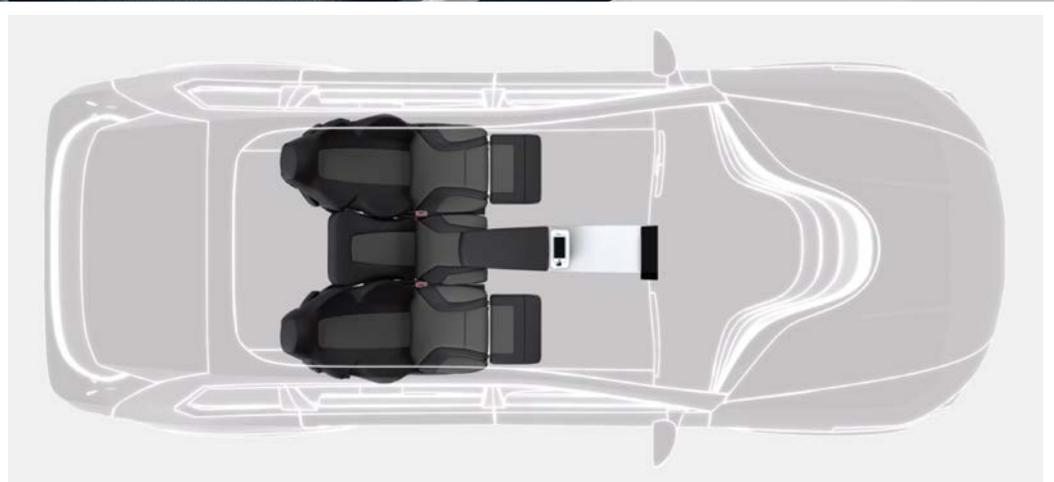
1 Brose sensor technology in the door identifies the user even before boarding. Projections on the window glass greet the passengers with personalized information, for example about the planned route. The door swivels or slides to provide access to the already air conditioned interior.

2 Up to 80 motors and drives work in unison for a seamless transition between the different interior configurations. The seat assumes an upright position in work mode; a table folds out of the center console and the steering wheel retracts into the cockpit to make room for a screen.

3 The back seat can comfortably accommodate three people, or the seat row can be divided to provide two passengers maximum comfort in individual seats with a contoured cushion and backrest. Reclining is even possible in the second row thanks to leg rests. Splittable screens with up to four personalized audio/video zones extend from the middle armrest and cockpit.



2
Working



3
Relaxing

A NATURAL RIDING EXPERIENCE

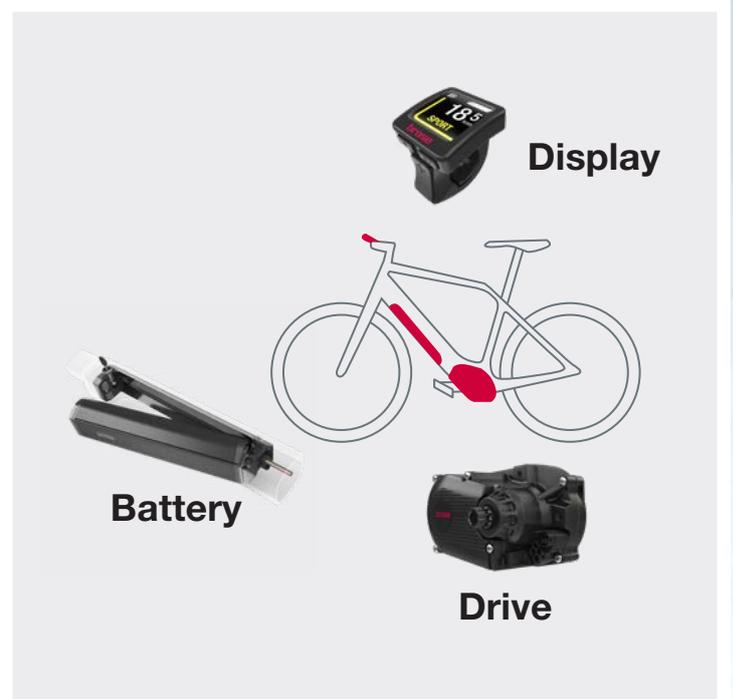
The mobility transformation extends far beyond the automobile: the e-bike has now become a trendsetter as an environmentally friendly, agile and healthy way to travel.

Brose has transferred its expertise from the development and production of millions of electric motors and drives for the automotive industry to the e-bike segment. The result is an amazing riding experience “Made in Berlin”.

No sudden power surges and no loud motor noises – all thanks to the design of Brose e-bike drives. Highly-sensitive sensor technology enables precise regulation of drive power. Pedal harder and you get more support – the drive is dynamic and harmonious, yet extremely quiet and virtually vibration free. And if you don't need assistance, Brose's dual freewheel technology allows you to ride your bike completely decoupled from the motor and drive system. This eliminates all pedal resistance and the e-bike responds like a regular bicycle.

There is an e-bike drive for every application. The harmonious Brose Drive C is perfect for the city, while the efficient all-rounder Brose Drive T has the power you need for long bike trips or commuting to work. The Brose Drive TF is designed for speeds of up to 45 kilometers per hour and the powerful Brose Drive S provides up to 410 percent pedal assistance for top performance in tough terrain. The drives with a magnesium housing are more compact and 500 grams lighter than their aluminum counterparts.

Together with specially adapted displays and a powerful battery, the drives are part of the intelligent Brose Drive System. The cloud-based Brose Service Tool facilitates certified dealers in fine tuning, diagnostics and maintenance of the drives. Around 40 manufacturers worldwide rely on Brose's e-bike systems.





SUSTAINABLE GROWTH

The long-term development of our family-owned company has been at the center of what we do for more than 110 years. Our daily actions are based on values and an awareness of the environment for the benefit of the present and future generations.

ECOLOGICAL RESPONSIBILITY

Brose technology actively contributes to environmental protection: our lightweight systems for doors and seats and efficiency-enhancing drives reduce energy consumption and emissions in vehicles. Environmental protection and the conservation of natural resources are a matter of course for us. In line with our Brose environmental standards, we already consider 40 aspects such as harmful substances and the energy balance as early as the development phase. We optimize our production processes, logistics and use of materials in manufacturing. One example is our state-of-the-art paint finishing system, which reduces wastewater by 95 percent.

FINANCIAL FORESIGHT

Our stable ownership structure makes Brose a reliable partner. Already in the fourth generation, our shareholders put their personal interests behind those of the company. Profits are systematically reinvested. This enables us to successfully handle technological change and growth using our own resources – so we can retain our independence for the benefit of customers, business partners and employees.

MODERN LEADERSHIP CULTURE

Brose is continuing to develop its understanding of leadership, putting an emphasis on entrepreneurship. Priorities include a sharper customer focus, fast and clear decision-making paths and an enthusiasm for success while still showing humility. This also includes team spirit and openness, a willingness to learn and the courage to make changes as well as supporting and promoting our employees.

THE NEW ARBEITSWELT

More digital. More flexible. More agile. Rollout of the “Brose Arbeitswelt 3.0+” began in 2019. This new working environment is visible in the corner sitting areas, which are used for meetings or for privacy. Team zones and state-of-the-art visualization and communication technologies provide space for spontaneous or planned workshops. This motivating working environment includes even more flexible working hours and additional offers that foster a good work-life balance and is complemented by comprehensive fitness and health programs.

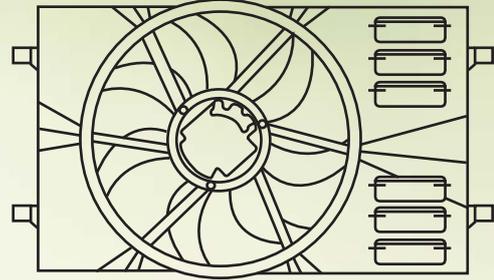
-33% weight

LIGHTWEIGHT LATCH

The Exterior business division's new lightweight latch weighs a mere 410 grams and replaces the current modular latch (620 grams). With a production volume of around 450,000 latches/year, this translates into a reduction in CO₂ of 2,144 tons or roughly the annual emissions of 1,000 mid-range cars traveling 12,000 kilometers/year.



-30,000



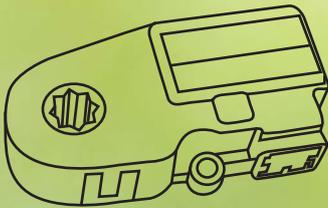
tons of CO₂

SHROUDS FOR COOLING FAN MODULES

The Drives business division manufactures more and more of the shrouds for its cooling fan modules using polypropylene. The lighter material reduces weight by about 17 percent, making the entire module 6 percent lighter. On just a single order of 4.2 million units, this translates into a 30,702 ton reduction in CO₂ emissions, or roughly the annual emissions of a German town with a population of 3,500.

-20

% package space



INTERIOR ACTUATOR

The Interior business division significantly reduced the package space of a multifunctional actuator to create a product that is 20 percent smaller and 10 percent lighter. Based on the planned quantities of 2 million units per year starting in 2022, we anticipate a CO₂ reduction of 280 tons – the CO₂ footprint of 9 families/year.

All information on CO₂ reductions relates to production and service life.

THINKING AHEAD

Moving outside of the familiar terrain, strengthening the power to innovate, developing new business ideas – these are the objectives of the Future Brose program. Collaboration with research institutes and the critical perspective of experts support these efforts.

In the era of horse-drawn carriages, Max Brose saw a future in cars. This openness to innovation paired with entrepreneurial spirit are the foundation of our success. We are building on this today with an agile innovation process as part of the Future Brose program and are pursuing new avenues such as the use of our drive systems in delivery drones and e-bikes.

Our future work also includes applications for software and digitization, two areas in which we rely on the expertise of leading industry experts who hold workshops with the shareholders, executive management board and advisory board of Brose to give advice and provide strategic orientation. The aim is to eventually add software products to the portfolio in a meaningful way to create new comfort features. Data-driven business models offer potential for the e-bike drives segment, where we want to develop services for consumers. We have already begun implementing initial ideas.

Brose also partners with renowned research institutes and universities worldwide in networks and projects. Collaboration with institutes like the Fraunhofer Society, Stanford University and the Massachusetts Institute of Technology (MIT) in Cambridge are just a few examples.



Software and connectivity offer great potential for Brose. The panel of experts at the 2019 International Motor Show exhibition booth confirmed this.

More than

100

universities and institutes
around the world belong to
Brose's research network

Around

3,000

engineers and technicians work on
new products and processes

Over

5,800

active patents prove the
innovative strength of Brose

“Mechatronic components will continue to play a key role in the future of the automobile. By systematically expanding its expertise, especially in the area of software, Brose can remain a driving force in tomorrow’s automotive industry.”

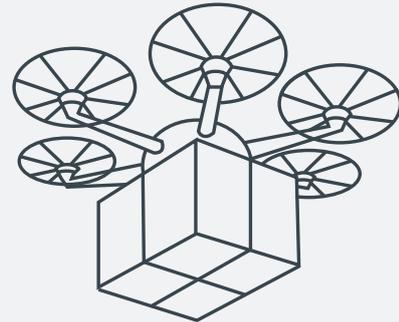
RICKY HUDI
CEO FMT – Future Mobility Technologies GmbH



Expert workshop in Bamberg. Focus topic: further development of the Brose electronics portfolio.



In addition to e-bikes, electric scooters could also be equipped with Brose drive systems in the future. In India we are already in talks with the country’s largest manufacturer in this segment.



Parcel, delivery and other services from the air – there are many applications for drones. We are examining the use of our electric drive systems in aerial vehicles.

“The impact of digitization on mobility presents a huge opportunity. To strengthen its leading position, Brose must now implement the cultural and structural changes with great resolve. Speed is critical.”

DR. MATHIAS DÖPFNER
CEO Axel Springer SE

CONNECTED TO THE FUTURE

Digital transformation is a driving force for innovation, especially in the automotive industry. Brose is utilizing digitization to continuously improve processes throughout the entire value chain with future technologies, advanced production systems and an entrepreneurial work culture.

CONNECTED VALUE CHAIN

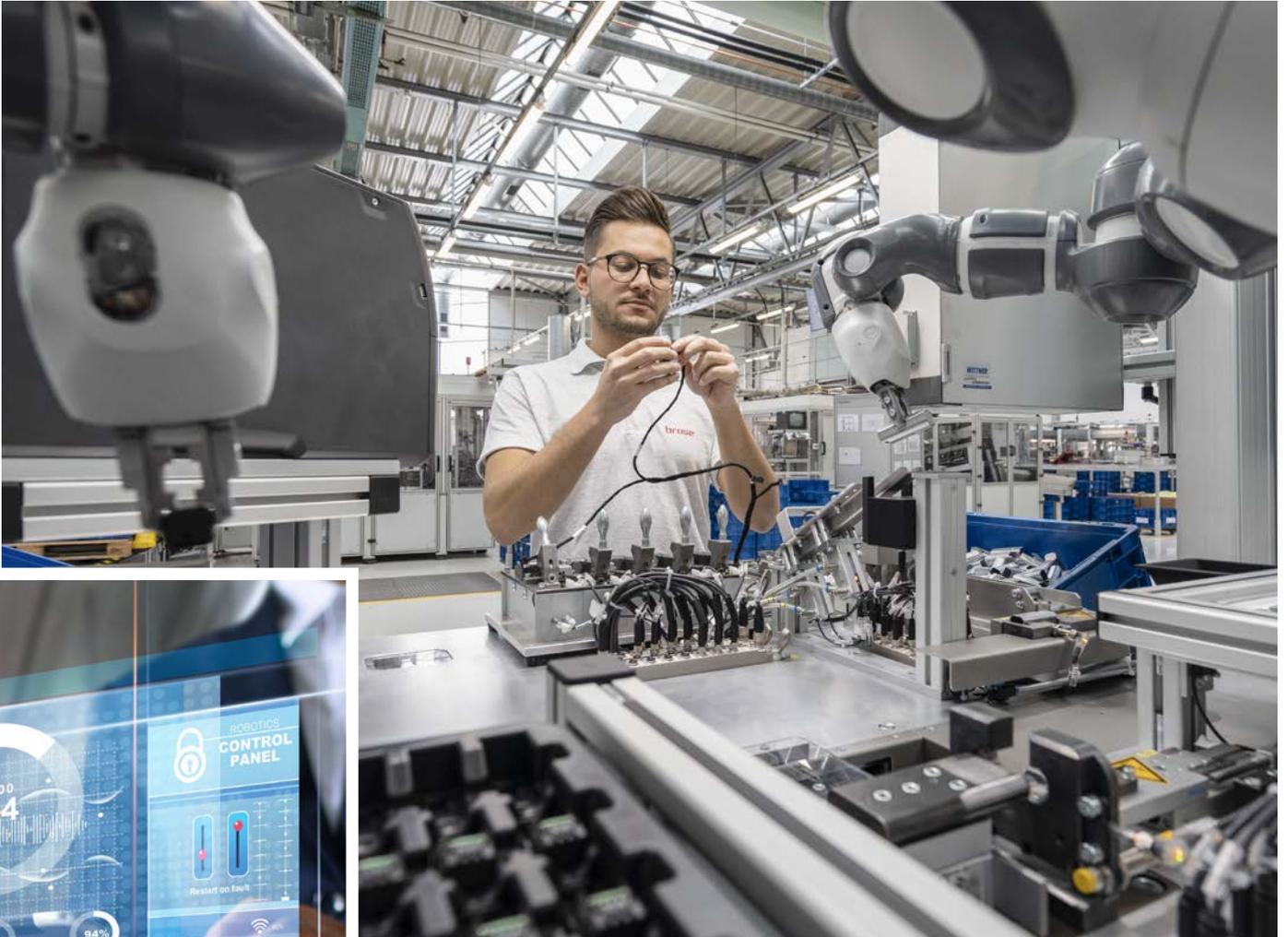
A continuous data flow is required to tap the full potential of digitization. In the future, all process steps will be connected – from the initial concept in advanced development to final inspection of the series product. “This will allow Brose to respond more quickly to customer changes, troubleshoot faults and prevent the repeat of errors,” explains Thomas Spangler, Executive Vice President Production. Consequently, the objective is to reduce costs, improve responsiveness and increase workflow precision. Thanks to faster transmission rates and decreasing storage costs, Brose now has access to new, data-driven technologies.

At the same time, there is a fundamental challenge to implementation: all data must be provided in a useful manner; that is, in a unified digital format. In the future, data that used to be processed manually, in PDFs, in ERP systems or using forms will be available via a common data platform.



DIGITIZING = BECOMING LEANER

Targeted workflows are needed to take advantage of the digital speed boost; unnecessary process steps generate redundant data. The keyword here is “lean”, and Brose wants to more fully integrate the principle of the “lean organization” within the company. Robots and software intensify automation not only in production, but also in error-prone and extensive routine activities in administration. One positive side effect of this is debureaucratization.



AUTOMATION FOR INDUSTRY 4.0

Brose has made numerous adjustments in production to increase speed, for example in mobile maintenance. Soon all maintenance engineers will get error messages sent directly to their mobile devices. The team member who can respond the fastest or with the most applicable skill set takes on the task. Technicians can also delegate maintenance work on the spot.

High-tech production control systems can help prevent minor disruptions from happening in the first place, telling when and where a fault occurred with which product by comparing the ideal process parameters with the actual conditions. They also monitor whether the pressing force is wrong with a faulty part or if there is a screwdriving error. This keeps downtime to a minimum in production. The advantages have been impressively demonstrated in the now fully automated mounting of the seat pan on the rail pair; eliminating this complex movement saves a lot of time and protects workers from physical strain. Data from the sensors flows simultaneously to the fault analysis systems.

A NEW LEVEL OF TESTING

More than anything else, digitization is accelerating development: thanks to database improvements and specialist knowledge on the behavior of materials and systems, simulation is now much more accurate – and Brose can shorten development times by a factor of six. “Our development engineers perform four virtual test loops before we build and test the initial prototypes. We are now able to create in a few days what used to take weeks,” explains Thomas Spangler. This not only saves material, but also dramatically reduces the error rate and the development costs. But most importantly, the customer gets a series ready product faster.



IN DIALOG WITH EXPERTS

The technical possibilities are one side of a successful digitization strategy, having the right mindset is the other. Brose's approach is to combine an entrepreneurial work culture with an open exchange of ideas. We invite experts to discuss ideas for the future of mobility in all major automotive markets sharing our views and ideas in 2019 at the TechDays in China, Germany and the United States or at international car shows. The main focus is the intelligent interaction of mechatronic systems, electronics and software to create new mobility experiences.



“The direct flow of data from series production will help us develop new products in the future.”

THOMAS SPANGLER
Executive Vice President Production



FOSTERING ENTREPRENEURSHIP

Innovation is always part of an entrepreneurial mindset. Likewise, every employee is aware of his or her personal responsibility for the quality of the products. Our managers know that you have to try out new things if you want to promote innovation – and sometimes these ideas are quickly discarded again. Young professionals at Brose have launched a company-wide project to raise awareness for this among employees. The aim is to deal openly with mistakes.



ACCELERATING INNOVATION PROCESSES

Cross-functional collaboration between our three business divisions generates concepts for new mobility experiences. The Brose InnoMax innovation process is designed to promote fast decision-making without the red tape and to flow directly into series development. This is very apparent at our newly introduced “Brose Pitch Days”, where project teams have five minutes to persuade attendees that their ideas are worth pursuing. Then a decision is made whether to continue with or stop the project. Customer benefit and business potential are the most important factors. Brose also encourages open dialog on innovation via the web.

GLOBAL COMMITMENT

Entrepreneurial responsibility and commitment to society have always been a part of the culture at Brose. Together with partners, initiatives and local institutions, we support more than 200 projects worldwide every year in the areas of sports, education, culture and society.



RESPECT RESPONSIBILITY

We help improve the situation of disadvantaged people at our international locations. Our activities in Taicang, China are one example: the “Inclusion Factory” project here creates a dignified and respectful working environment for people with disabilities. Brose China received the “Corporate Social Responsibility Award” for this project in 2019.



INNOVATION TEAM

“Formula Student” combines technology, teamwork and entrepreneurship. Students from around the world go head to head and compare KPIs of their race cars. Brose sponsors university teams from Spain, Slovakia and Germany. The greatest achievement to date: 4th in the world rankings for the Coburg team.



SUCCESS

TOP PERFORMANCE

9 championships in 15 years and 6 cup victories say it all: Brose Bamberg is one of the best professional basketball teams in Germany and has also made a name for itself internationally. This young team won the cup final in 2019 and is on its way back to the top of German pro basketball.



Tennis pro Kevin Krawietz made huge advances during his sensational 2019 season: he was the French Open champion in doubles, made top 10 in the world and conquered the hearts of many tennis fans. This was a major accomplishment because it was the first time in 82 years that a German doubles team won a Grand Slam tournament. Brose has sponsored Krawietz, who comes from Coburg, since 2008.



EDUCATION

PASSION

Thanks to the support of Brose, the Coburg State Theater has been able to showcase exceptional artists and bring outstanding productions to the stage like Richard Wagner's opera "Das Rheingold". This adds to the cultural flair of the city of Coburg and promotes the careers of young international artists.

MILESTONES

2019 at a glance for Brose.



BROSE COBURG CELEBRATES 100 YEARS

The start of in-house production of automotive parts in 1919 marks a milestone for Max Brose and his business partner Ernst Jühling. Over the past 100 years the business grew from a regional shop into an international automotive supplier. During an jubilee reception in July, the shareholders and executive management board welcomed representatives from politics, business, academia and culture to celebrate a century of success. Some 8,000 employees, relatives and friends attended the Family Day at the plant grounds.

POWER TO INNOVATE WORLDWIDE

The Technology and Innovation Days in Bamberg, Shanghai and Detroit showcased new products, innovative technologies and streamlined processes. Brose also collaborated with suppliers in these areas. We present the Supplier Innovation Award at ceremonies in Europe, Asia and North America. It is our highest recognition for suppliers for excellence in innovation and collaborative partnership.



NEW LOCATION IN SERBIA

Brose is increasing its capacities with a new development and production location in Pančevo. In October Thomas Spangler, Executive Vice President Production, signed a settlement agreement in the presence of German Federal Minister for Economic Affairs and Energy Peter Altmaier and Serbian President Aleksandar Vučić. We will initially launch production of drives and electronic systems for cooling fans only a few kilometers north of the capital Belgrade starting in the summer of 2021. Depending on turnover development, the location will create up to 1,100 jobs in Development, Sales, Purchasing and Production.





WORLD-CLASS DRIVE

A new chapter in cycling: the first UCI E-Mountain Bike World Championships took place in August 2019 in Mont-Sainte-Anne, Canada. On his Specialized bike with a custom Brose drive based on the Brose Drive S_{Mag}, Alan Hatherly won the title.



SUCCESSFUL TRADE FAIR PRESENTATIONS

A gesture or knock is all it takes to open the car door; the driver seat tilts for easier access to the already air conditioned interior. Brose presented this scenario for the future of mobility last September at the International Motor Show in Frankfurt on the Main with a “hands-on” exhibit. “Enabling Future Mobility” was the theme of our presentation that showcased our systems for comfortable vehicle access, flexible interior design and thermal management for electric cars. Our company also debuted a complete system for e-bikes comprising the drive, battery and display. Brose exhibited intelligent solutions and concepts for connected, electrified and autonomous cars at the Detroit Motor Show in January and at Auto Shanghai in April.

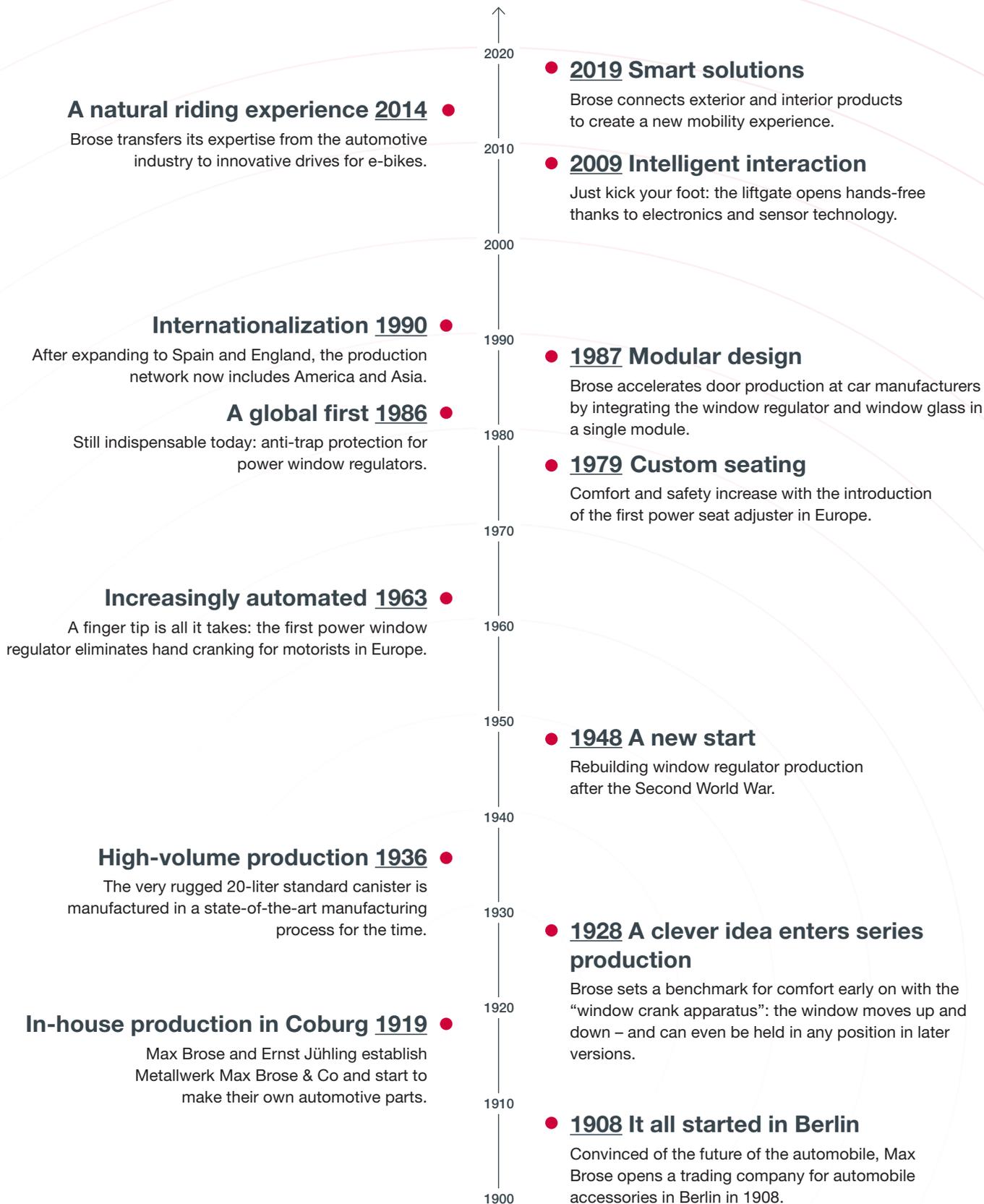


GREAT PLACE TO WORK

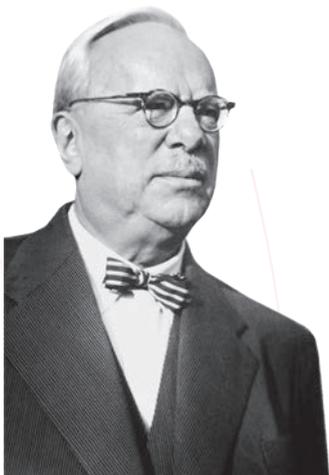
Brose took home 18 national and international employer awards in 2019, which shows that Brose knows what employees want: a motivating working environment, extensive employee benefits and interesting development opportunities. “In times of change it is important for us to remain an attractive employer in the automotive industry,” says Frank Hirschmann, Senior Vice President Human Resources.

OUR JOURNEY

The over 110 year history of Brose is full of special moments. They tell the story of entrepreneurial thinking and decisive action – with good instincts for automotive trends.



**“We have to be able to
depend on one another –
then the future will
belong to us.”**



Max Brose

MAX BROSE

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