brose
Excellence in Mechatronics

Smart Comfort Solutions




Contents

Excellence in Mechatronics

Brose is the world's fourth-largest family-owned automotive supplier. Every second new vehicle worldwide is equipped with at least one Brose product.

The company's intelligent solutions for vehicle access and the interior enhance comfort and flexibility.

With fundamental technological openness for the power-train, our products contribute to environmental and climate protection. Innovative concepts such as thermal management increase vehicle efficiency, thus contributing to sustainable mobility.

Brose's system expertise enables new features in all types of vehicles – whether two- or four-wheeled.

Around 25,000 employees at 65 locations in 24 countries generated a turnover of 5.1 billion euros in 2020.

Dear Readers,

Transportation is becoming increasingly electric, automated and connected. The way in which we experience mobility is also evolving: more and more people desire means of transportation that are comfortable, safe and as environmentally friendly as possible and that can be used individually and flexibly.

Brose wants to respond to these demands, which is why we are complementing our many decades of experience in mechatronics with sensor technology and software. Connecting our products creates intelligent systems with perfectly coordinated components. Powerful electronics and software ensure the smooth interaction between components that previously worked independently of one another. Doors, liftgates, seats, center consoles and air conditioning all work hand in hand to ensure maximum comfort and convenience. This requires a comprehensive understanding of the vehicle as a whole.

Our products create added benefits and new amenities for consumers. They also enable us to play an active role in protecting the environment and combatting climate change. For example, integrated thermal management concepts boost efficiency, thereby increasing the range of hybrid and electric vehicles. Soon our e-scooter motors will improve air quality in cities throughout India. Last but not least, Brose e-bike drives help people with varying levels of fitness travel even very long distances without having to rely on cars, particularly in urban areas.

Brose makes mobility a sustainable experience –
with Smart Comfort Solutions.

Sincerely,

Ulrich Schrickel
CEO of the Brose Group

Shaping mobility experiences

Automated driving, electrification and connectivity paired with shared mobility are changing the way we get from point A to point B. The focus is on the demand for more customization, flexibility and comfort.

To satisfy these requirements, we are connecting our mechatronics components with proprietary software and sensor technology to create intelligent systems. This is how Brose is enabling innovative features and shaping new mobility experiences.

Convenient access

When approaching the parked car, the vehicle recognizes and welcomes the driver with window projections. The user makes a gesture to signal the desire to enter. The door opens automatically. At the same time, the steering wheel lowers into the dashboard and the seat adjusts automatically to make boarding easier.

This new access experience is made possible by our ability to seamlessly blend our vehicle access and interior expertise. Our portfolio comprises all of the necessary components from power opening latches and side door drives to collision and anti-trap protection sensors.

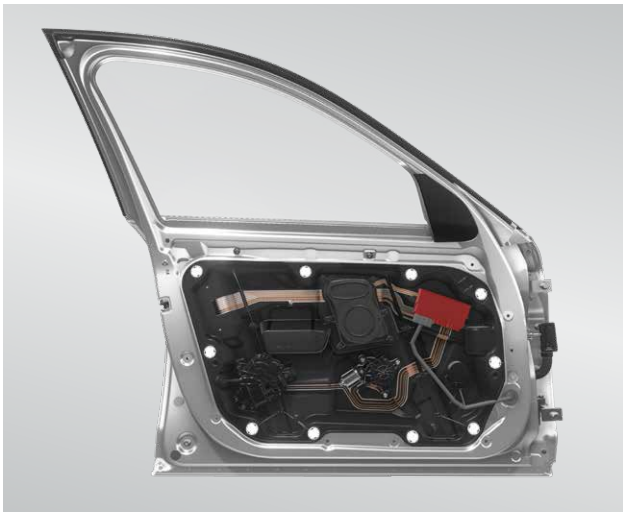
Brose brings its experience as a long-standing market leader for power liftgate systems to the development process.

Complete control in the side door

In a car-sharing service parking lot, projections in car windows make it easier for customers to select their vehicle – availability, battery charge and pricing are instantly visible.

A new generation of Brose control units coordinates all of the electronic functions in the door – from window regulators to blinds all the way to the side door drive. This also includes innovative concepts such as window projections, virtual outside mirrors or active noise canceling.

The so-called zonal control units with built-in functionality can be flexibly integrated into various vehicle architectures.



Access systems for driverless shuttle buses

Just moments after purchasing a ticket via an app, a driverless shuttle bus approaches. The passenger authenticates himself at a control interface. Sensors ensure a safe entry and exit.

Robotaxis and autonomously powered buses – known as people movers – will play an increasingly important role in urban mobility scenarios of the future.

Brose has teamed up with a partner to engineer an access concept for people movers.

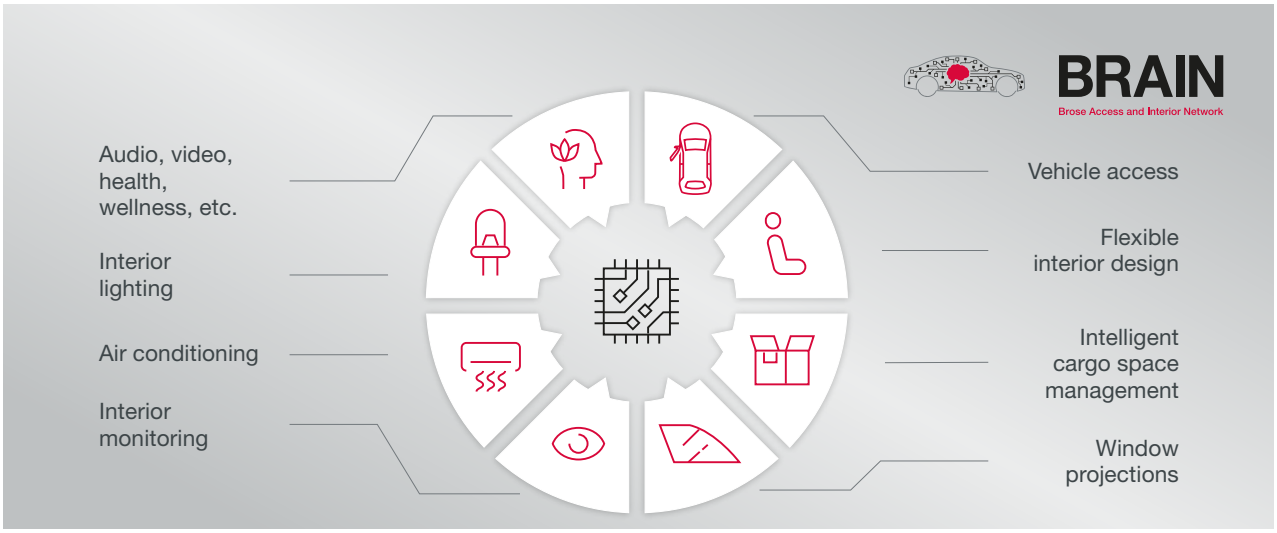
Among other features, the system includes control interfaces, obstacle detection and techniques for vehicle doors that open and close fully automatically. We also develop safe, comfortable solutions for standing and leaning during transport.

New high-performance sensors

A gesture or flick of the foot is all it takes to “magically” open doors or liftgates. What is more, they can identify obstacles and stop movement before a collision occurs.

The same applies to seats that move and fold automatically. It is important that passengers are not injured and the interior of the vehicle is not damaged in the process. Brose has developed powerful radar sensors for this purpose. Their precise and reliable functionality makes many new comfort features possible in the first place.

But the sensors offer a number of additional functions: from parking assist and anti-theft protection to interior monitoring that can identify and distinguish between small children and pets.



Intelligent feature connectivity

Makes buying furniture a breeze: the user's smartphone scans the dimensions of bulky items in the store. A radar sensor scans the vehicle interior. Intelligent software determines from the signals whether there is enough room in the car to transport the items. Once the user returns to the vehicle, the interior has already adjusted to offer the perfect amount of space, making it easy to load the vehicle with the items purchased.

Comfort features like these would not be possible without the intelligent interaction between all adjustment elements. Brose also supplies the software.

"BRAIN – Brose Access and Interior Network" is able to control our components such as door drives and seat adjusters and even products from third-party suppliers. The modular system can be flexibly integrated in electronics and software architectures. The standardized interfaces make adding new features quick and easy.

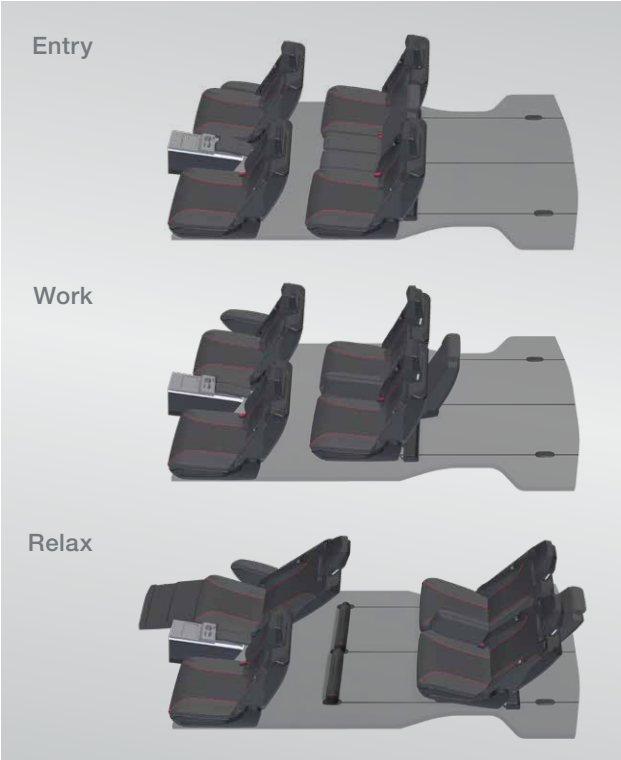
Linking these systems to the cloud opens up new business models that allow users to book features permanently or only temporarily – like the "Furniture Store App" described above.

Adaptable interior

In the future passengers will decide how they wish to spend their drive. Whether they choose to work, relax or drive the vehicle themselves: electronically controlled seats, screens and storage areas automatically coordinate their positions and the flow of air from the AC system adjusts accordingly.

A newly developed Brose rail system allows interior elements to move independently of one another. If desired, the back seat can rearrange to form two individual seats with power adjuster features that allow passengers to fully recline for ultimate relaxation – or the interior can flexibly adapt to offer maximum cargo space. This happens quietly and quickly thanks to our drives.

Integrated cargo modules in the seat rail make it possible to use the entire vehicle as a cargo space. Charging boxes, even pets can be secured by them, e-scooters can be connected to the modules. The modules feature a data and power interface that enables the use of additional services such as battery charging.



Expertise in seat structures

First and foremost, seats need to be comfortable so that passengers can arrive at their destination relaxed even after a long journey. But the requirements for today's seats are more complex. They protect occupants with airbags, integrated seat belts and headrests, meaning they play a large role in safety within the vehicle.

Brose supplies around eleven million front and rear seat structures annually to vehicle manufacturers throughout the world. Our portfolio ranges from manual seat adjusters to power seat structures with lumbar support and a massage function.

In addition to seat structures, we also offer mechatronic systems for the complete interior such as center consoles with power adjustment. We also use sensor technology and software to connect mechatronic products. This creates intelligent solutions for the vehicle interior.

Pay-per-use comfort

Book a ride sharing service, get in, relax – Brose is following this approach in a project in the United States: together with startup Ivee and mobility providers UBER and LYFT, we are testing a software-based pay-per-use model. Participating vehicles are equipped with retro-fittable massage systems by Brose that customers can book and pay for via an app, just like the service itself.

The ride becomes a relaxing experience thanks to this invigorating comfort feature.

Safe in every situation

Relax, kick back and unwind. Driving should be a stress-free experience. Vehicle interiors offer occupants more and more comfort, for instance with reclining seats. But if an accident is imminent, things must happen quickly. Passengers must be brought into a safe, upright position before impact.

To make relaxing even safer, we have taken our many years of experience in drives and applied it to electronically commutated motors for seat adjustment. Our seat adjusters change position quicker and quieter than conventional variants. In the event of an imminent collision, the acoustically optimized drives return vehicle seats to an upright position in fractions of a second to guarantee adequate protection for vehicle occupants.

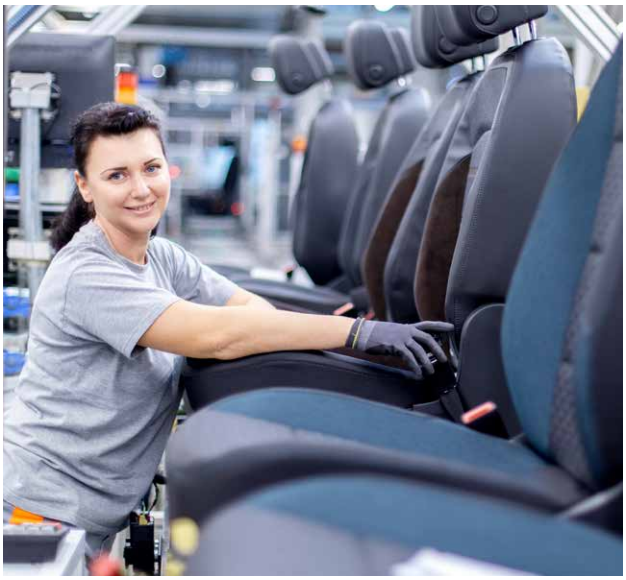
Getting seats back into the driving position quickly will become even more important as traffic automation increases. If the driver hears a sudden warning: “Obstacle ahead, please take control!”, he or she must react promptly and take the wheel again to avoid the dangerous situation.

Complete seat systems

Seats are a key differentiator in interior design. They have a major impact on the user experience in terms of comfort. E-mobility, autonomous driving and cross-system connectivity are changing the requirements for the interior of tomorrow. Requirements for comfort and safety are supplemented by new and flexible options for personalized design.

Together with Volkswagen, we want to create a key global system supplier for vehicle seats and interior concepts. The portfolios of the participating companies complement each other perfectly. Volkswagen subsidiary Sitech has extensive expertise in the development, assembly and logistics of complete seat systems.

The planned joint venture Brose Sitech will expand business with the Volkswagen Group and also act as an independent seat supplier for other car manufacturers. Brose Sitech’s aim is to become one of the largest providers in the hard-fought market for vehicle seats. The transaction is expected to be concluded by early 2022.



Increasing efficiency

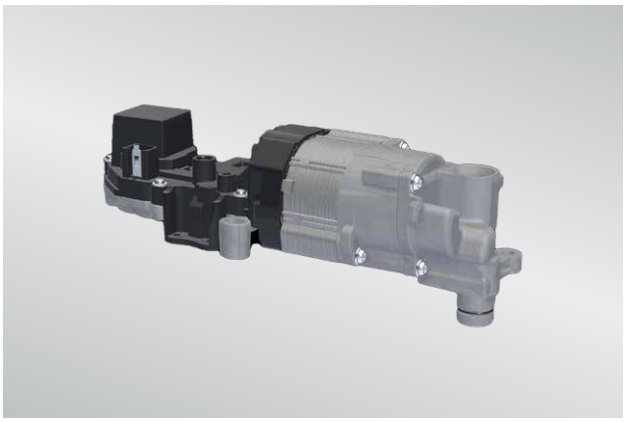
The electrification of mobility is progressing steadily worldwide. This creates a promising field of growth for Brose and our climate-friendly innovations.

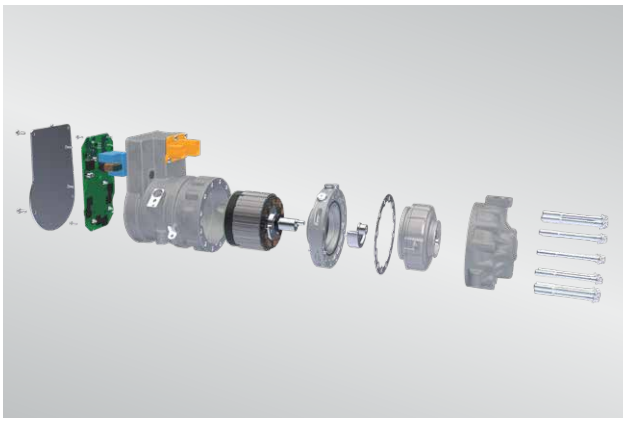
Our power auxiliary systems improve the efficiency of hybrids and e-vehicles alike, which in turn reduces energy consumption, extends range and contributes towards sustainability.

Extending reach and maximizing comfort

Alongside the vehicle drive system, air conditioning for the vehicle interior and the battery consume the majority of energy in electric cars – which means that maintaining the ideal temperature during a trip reduces range. Brose significantly increases the efficiency of electric vehicles with its integrated thermal management approach. The core element of the system is our electric climate compressor. The product works with common operational voltages from 48 to 810 volts and runs with both chemical and natural refrigerants. This enables ultra-fast charging and makes it possible to use the compressor as a heat pump.

Brose also develops compact thermal modules that integrate other components such as heat exchangers alongside the compressor for even greater efficiency advantages. The systems generate heat and cold in a closed circuit and control how they are distributed throughout the vehicle based on specific requirements. Optionally, the system is available with a hermetically sealed refrigerant circuit. The circuit is prefilled by Brose and operates maintenance-free.





More efficiency with perfect handling

Automatic stop-start technology and “coasting” save fuel by switching off the combustion engine and reduce CO2 emissions. This applies to hybrids as well as to conventional passenger vehicles.

During this process, Brose‘s electric oil pump maintains oil pressure in the transmission. Handling is not affected and the vehicle restarts without any time delay. At the same time, the transmission operates more smoothly and quietly.

Shorter development times thanks to modular concepts

As part of their electrification efforts, manufacturers rely on a variety of electronics architectures with voltages ranging from 48 to 810 volts. This is why Brose engineered a modular motor and electronics system that uses standardized components and interfaces. This makes it possible to adapt our motors and auxiliary systems to a broad range of requirements, even accommodating local differences. Additional advantages of the modular system: independent of the vehicle drive, carmakers benefit from short development times, robust products and economies of scale in global production.

Utilizing expertise

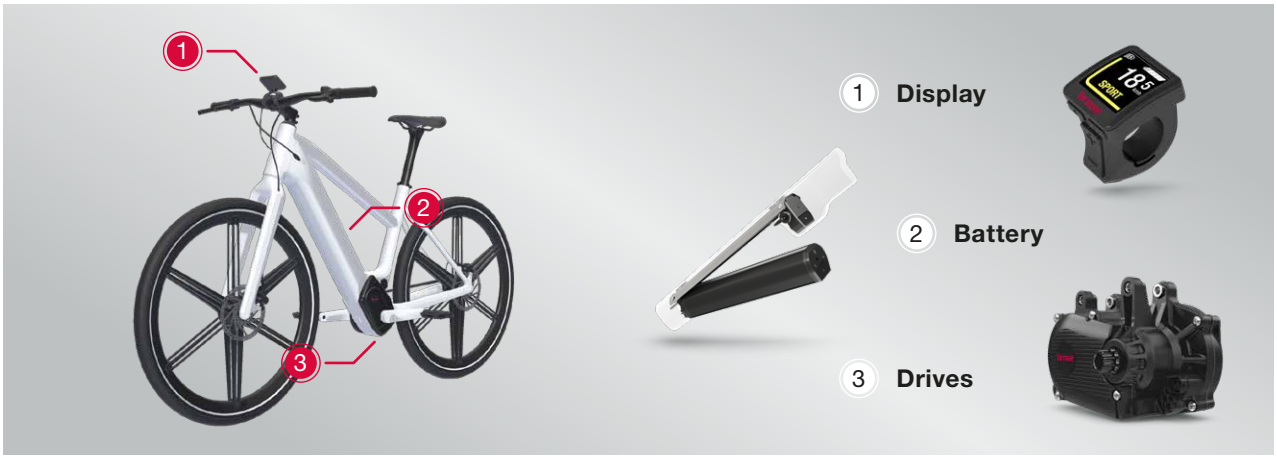
Brose is transferring its decades of experience in developing and manufacturing electric drives for the automotive industry to other sectors, establishing itself as a system supplier there, too.

Trends such as electrified micromobility or new logistics concepts for metropolitan areas are opening up many opportunities and paving the way to new markets.

Systems for more driving fun

Brose has been actively involved in the emerging e-bike market since as early as 2014 and is one of the top three suppliers of drives with mid-hub motors in Europe, the strongest sales region. 150 employees at our Berlin-based e-bike competence center develop and produce systems used worldwide in models made by 50 manufacturers.

The drives are especially popular among high-performance riders in the sport sector. The Brose portfolio includes drives for any number of applications from city bikes to mountain bikes along with displays and battery packs. Digital services and the systematic approach are becoming increasingly important in the development of e-bike systems as electrically powered bicycles become more connected. Software-based service tools which dealers and bike shops use for troubleshooting and maintenance are essential elements of our system portfolio. This also includes an app that lets cyclists customize assistance levels and record their routes.



Electric scooters

Due to environmental and climate laws, Asia is emerging as a promising market for electrically powered small vehicles like scooters and motorcycles. Brose wants to tap into this potential and will begin supplying motors, control units and power electronics for e-scooters in India starting in 2022. In doing this, we are helping to improve the air quality, particularly in cities.

We are expanding our portfolio to include drives for many different performance classes, software solutions for battery management and conversion kits for conventional two-wheelers.

The future of parcel delivery

Unmanned delivery drones are expected to relieve the burden on inner-city traffic in the future. Fewer trucks and transporters on the roads mean less greenhouse gases and air pollution.

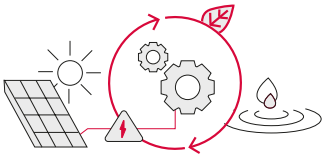
Brose is partnering with an international online retailer to develop the highly efficient drive units for drones required by this sector. Our established quality standards help us meet the stringent demands of the aviation industry. The first prototypes will take off in 2021.

In Detroit, USA, Brose is participating in a solar park project from which we will obtain climate-neutral electricity from 2023.
© Mark Houston, DTE Energ

Assuming responsibility

For more than 110 years, long-term development has been at the center of all we do here at Brose. For us, sustainable work means combining our economic vision with our sense of responsibility toward our employees and the environment.

Our stable ownership structure ensures the continuity required to achieve these objectives. We have set ourselves ambitious targets in our new sustainability strategy to also fulfill our corporate responsibility in the future.



More efficiency – fewer emissions

Mechatronic systems from Brose help manufacturers shape new comfort experiences – while also offering an advantage for the environment: regardless of the type of vehicle drive, they reduce energy consumption along with emissions.

We achieve these aims with consistent lightweight design while our power auxiliary systems – from air conditioning to steering – boost the efficiency of mechatronic systems in vehicles.

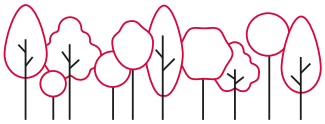
Environmentally conscious product development

We have considered aspects such as emission-free operation and energy consumption in the development of our products for decades. In addition, Brose incorporates reusable components and materials with a small CO2 footprint whenever possible. We optimize our production processes, logistics and use of materials in manufacturing. For example, Brose commissioned a zero-emission paint plant in the Chinese city of Taicang in 2020. It reuses 95 percent of the water consumed.

Fair treatment

Motivated employees are our most valuable asset. This is why Brose promotes and demands active entrepreneurship. Our employees can help shape the company‘s success at all levels.

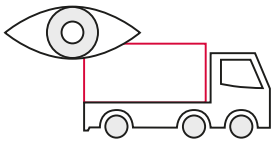
We offer our workforce an attractive working environment, interesting development opportunities and fair compensation. Our family-owned company’s values are readily apparent in our uncompromising commitment to occupational safety and health and the respectful way in which we treat each other. For example, trust-based working hours have been in place for our employees for years.



Climate-neutral by 2025

Brose’s objective is to become a CO2-neutral company: by 2025 all of our locations worldwide will operate in a climate-neutral manner. Procuring CO2-neutral energy as well as producing it ourselves are critical components of this strategy.

Another area for leverage is reducing energy consumption by implementing more efficient manufacturing processes. Where emissions cannot be avoided, Brose will invest in high-quality compensation projects.



Focus on the supply chain

Brose works closely with business partners to ensure the most environmentally friendly life cycle possible for our products.

For instance, we also expect our suppliers to comply with high sustainability standards: alongside quality and price, systematic alignment and compliance with sustainable principles is a requirement when awarding contracts.

Global commitment

We sponsor projects in the areas of sports, education, culture and society in regions surrounding our group locations.

Brose cooperates with partners, initiatives and institutions in 20 different countries. One example is “Gesanghua Education‘s Aid”, a Chinese charity organization that we work with to sponsor the education of 30 disadvantaged children.

Your contact to us

customers: Marc.Schlueter@brose.com

applicants: brose.com/karriere

suppliers: brose.com/einkauf

media: presse@brose.com

Brose Fahrzeugteile SE & Co.
Kommanditgesellschaft, Coburg

Kommunikation und Marketing

Max-Brose-Straße 1
96450 Coburg

brose.com