

## Motors for Electric Vehicles

Energy efficient  
Durable  
Compact



## Quality Drive Unit Solutions for Electric Vehicles

### Efficient system solutions from a single source for high performance with low energy use

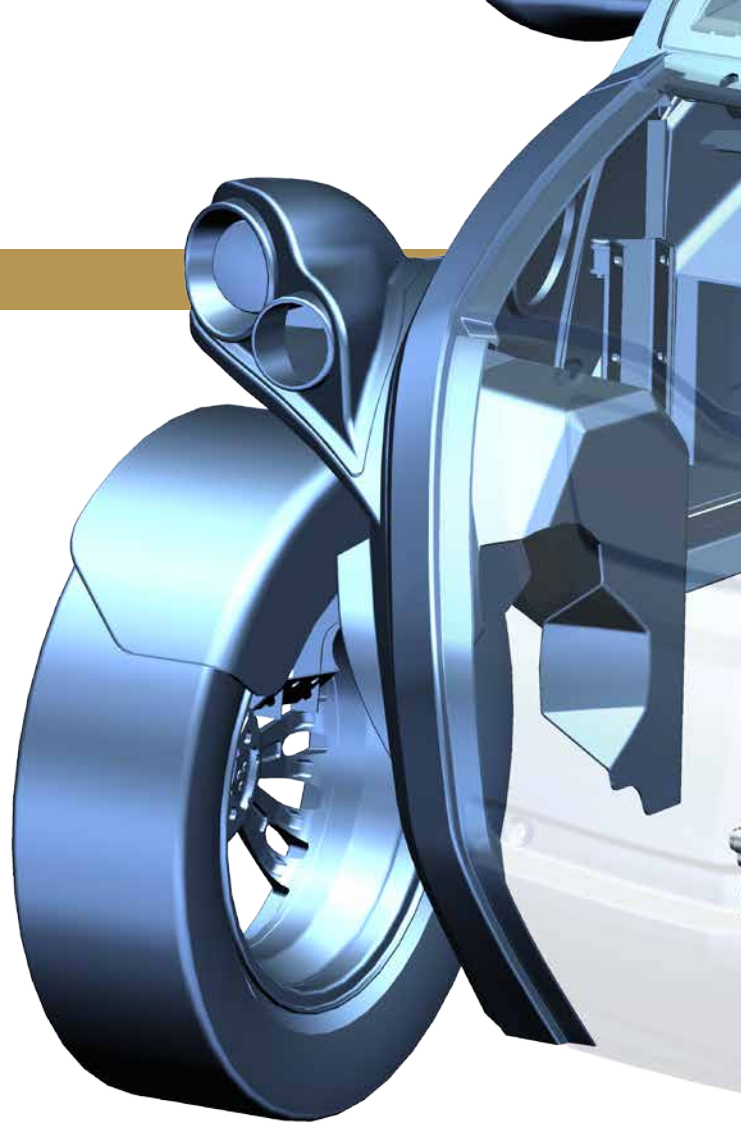
Manufacturers of electric vehicles require a well-thought-out drive technology with the best performance:

- In addition to economical driving techniques and good aerodynamics, in order to travel long distances, first and foremost efficient drive components are required
- The high requirements on automobile and load weight require light-weight construction for all the components
- The dynamic response and quiet operation of the drive unit system must be designed to ensure the optimal driving comfort
- Rough environmental conditions and a long operating life require robust and reliable solutions

From ABM Greiffenberger, you receive for your application an optimally tailored drive unit solution that fulfills these requirements with the highest performance.

### Experience and Competence

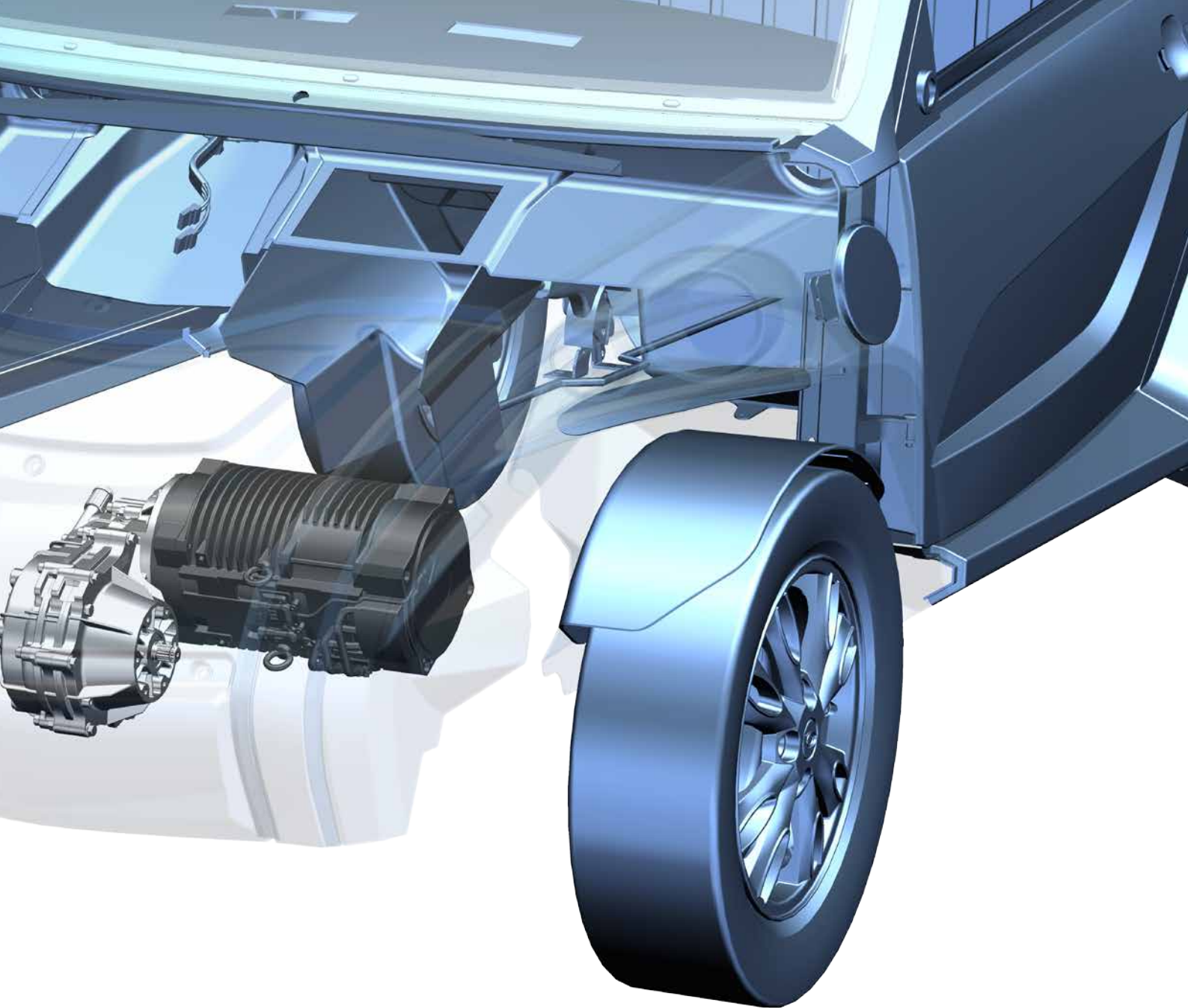
ABM Greiffenberger has been one of the world leading manufacturers of electric drive unit systems for battery powered vehicles, especially for material handling. This experience and competence guarantees particularly reliable and innovative drive unit solutions. If for on-road applications, for all-terrain vehicles, or for different applications in utility vehicles, agricultural vehicles, and mobile construction vehicles, we know to deal with low voltage and high current.



### Exemplary Energy Efficiency

Already today, ABM Greiffenberger utilizes pioneering technologies and materials in many markets which considerably increase the energy efficiency of the motors. The industry-wide proven asynchronous motor was further developed by us for use in mobile traction drive units. Therefore, a very economical alternative to the often preferred permanently excited synchronous motor.

For auxiliaries and accessory equipment, there is also the permanently-excited, sensorlessly controlled, compact and affordable SINOCHRON® Motor. The electronic control optimized for the specific application once again greatly reduces the system losses for the entire operating mode and increases the efficiency of the entire system.



## System Supplier

ABM Greiffenberger offers you gearboxes, motors, brakes, and customer-specific drive control from one supplier. All components are optimally matched for each other. The problematic steps between various suppliers are thus avoided.

Our established competence stretches over all processes, from the aluminum-casting foundry and CNC-machining of the housing to the manufacturing of shafts and cutting of gear teeth, from motor development technology to the assembly and final testing of the products.

## Development Expertise

To realize a custom drive unit solution for your application, we offer our competent team from our project planning, design, manufacturing and sales departments.

The development and manufacturing of gear boxes, motors, and the associated drive electronics are the core competence of ABM Greiffenberger for decades. If for safety and environmental conditions for crane drive units or material handling vehicles, for efficiency and noise requirements from renewable energy and warehouse logistics or for the required dynamic response for all these and many other industry applications: with us, you profit from this rich wealth of experience.

As part of our general development, we constantly investigate new technologies and materials, in order to always stay a step ahead.



## 15 kW Traction Motor

E-vehicles must achieve the allowed speeds in the city as well as on the express way and rural roads. The vehicle class L7e with an effective power of 15 kW and limited empty weight enables an almost unlimited maximum speed.



## 8.0 kW Traction Motor

The 8.0 kW Motor is designed for small e-vehicles that mainly are used in city traffic and are limited to the class L6e with 45 km/h. It can be used without a fan in normal operation and is very well designed for tight spaces.



## 4.0 kW Traction Motor

This motor enables short stop and go as well as acceleration and braking cycles. Therefore, it is the ideal motor for light-weight e-vehicles for recreational uses, for off-road vehicles – for example, golf cars or ATVs – and alternatively for transport vehicles that have limited space, like for example in mail delivery.



## 1.5 kW Traction Motor

Typical uses for this electric motor are for scooters and go-carts. Due to the excellent acceleration in comparison to combustion engines, electric vehicles enjoy ever increasing popularity.

Power Nominal / Peak [kW]	15.0 / 27.0
Max. Torque [Nm]	100
Max. Speed [min <sup>-1</sup> ]	8,000
Length [mm]	336
Diameter [mm]	220
Weight [kg]	43

## Electric automobiles



© StreetScooter GmbH

Power Nominal / Peak [kW]	8.0 / 15.0
Max. Torque [Nm]	70
Max. Speed [min <sup>-1</sup> ]	6,000
Length [mm]	336
Diameter [mm]	200
Weight [kg]	39

## ATVs



Power Nominal / Peak [kW]	4.0 / 7.0
Max. Torque [Nm]	45
Max. Speed [min <sup>-1</sup> ]	4,500
Length [mm]	273
Diameter [mm]	180
Weight [kg]	27

## Shuttles



Power Nominal / Peak [kW]	1.5 / 2.5
Max. Torque [Nm]	18
Max. Speed [min <sup>-1</sup> ]	4,500
Length [mm]	208
Diameter [mm]	140
Weight [kg]	18

## Scoters



## Energy efficient SINOCHRON® Motors

The SINOCHRON® Motor from ABM Greiffenberger is a permanently-excited synchronous motor with high efficiency, high power density, and compact dimensions. The special design of the rotor with internal magnets leads to an almost ideal sine distribution of the magnetic flux.

SINOCHRON® Motors are ideal for the sensorless control mode. Therefore, they are an economical alternative to expensive servo drive units.

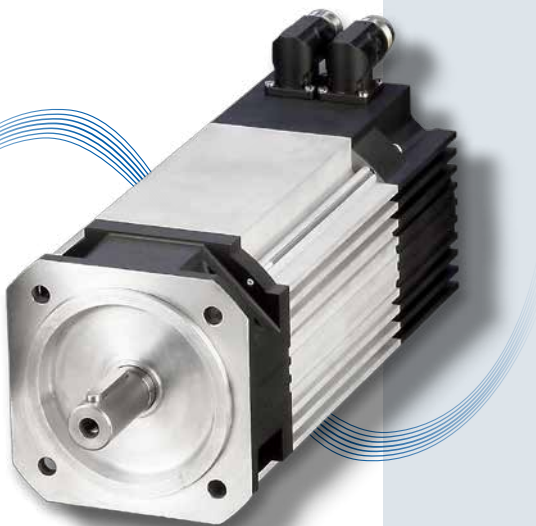
Because no external magnetization is required, there are no losses in the rotor through magnetization currents. Because of this, SINOCHRON® Motors from ABM Greiffenberger have a constant high efficiency in almost the entire range of RPMs. The comparison of efficiencies below shows the significant benefits of the SINOCHRON® Motors.

The rotor is constructed simply and robustly. The entire need for sensor electronics for speed and position, including their connectors, is eliminated. These together enable a very high reliability and availability.

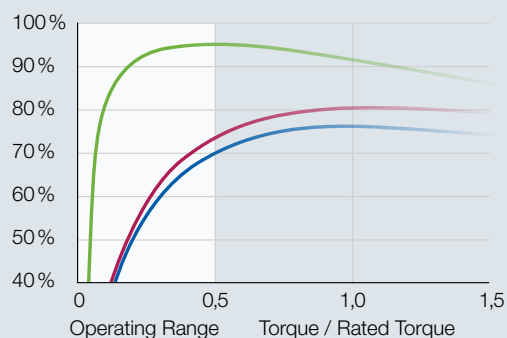
SINOCHRON® Motors are ideal for all applications with constant torque in the entire RPM range and fluctuating loads.






*Typical uses for SINOCHRON® Motors are for auxiliaries in utility vehicles, busses, agricultural devices and construction machinery.*



### Efficiency



-  SINOCHRON® Motor
-  Asynchronous motor with a copper rotor
-  Asynchronous motor with an aluminum rotor

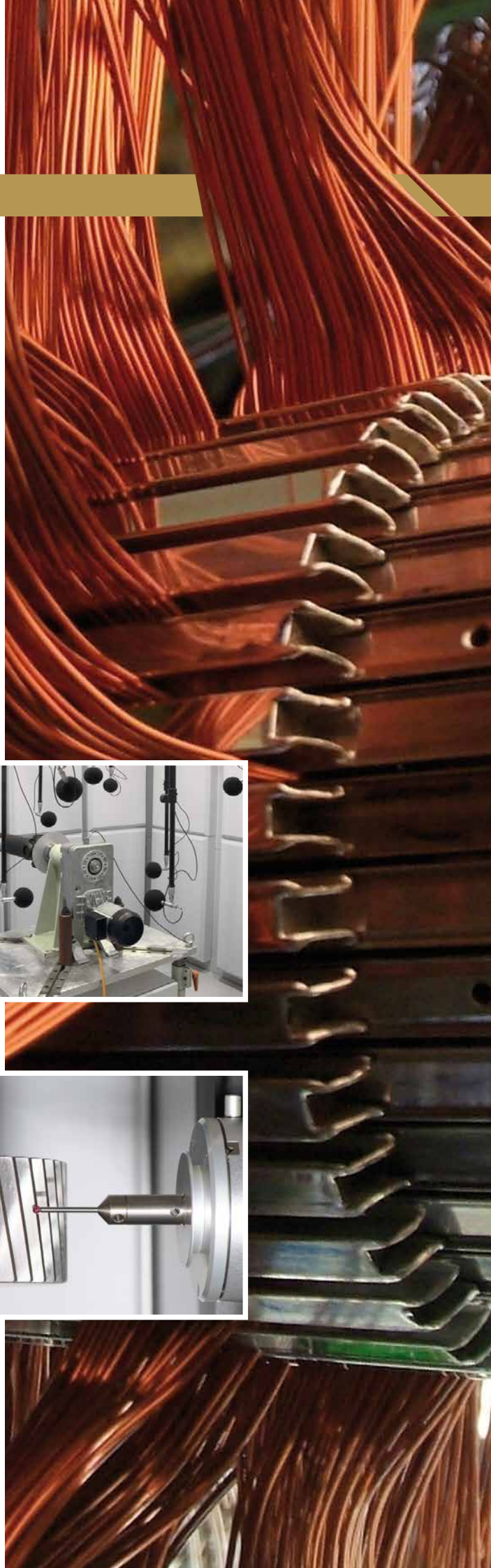
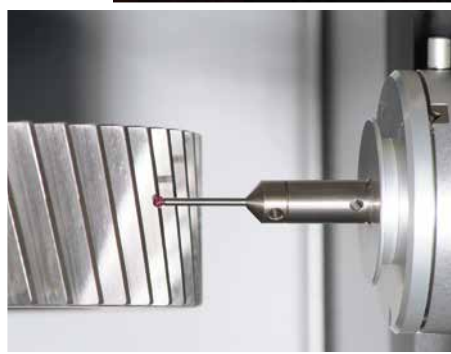
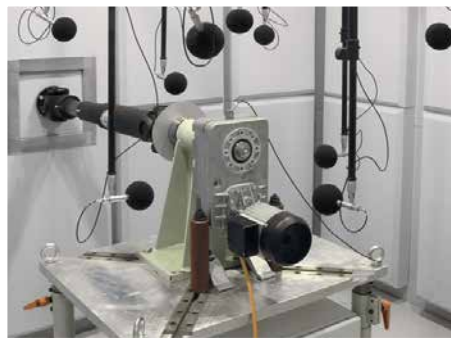


## Quality already in the Planning Phase

Quality needs to be the highest priority starting in the planning stages: that is our conviction. That is why we at ABM Greiffenberger begin with the careful analysis of the target markets. After that, our quality philosophy is reinforced by long-sighted quality planning and detailed design and careful selection of materials and suppliers.

Our manufacturing processes are accompanied by intensive quality tests and analyses, such as SPC. Endurance tests, laser-assisted detailed measurements, latest measurement technology and 100% checks controlled by our professional CAQ system: with this thorough network of testing, we provide the high reliability of our products.

Certification according to DIN EN ISO 9001 : 2008 and environmental management certification according to DIN EN ISO 14001 : 2004 are a given. The easy approval and acceptance of your equipment and vehicles is ensured through the conformance of our drives with the essential norms such as CE, VDE, DIN, UL/CSA.



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