

EXPERIENCE MOBILITY

PRODUCT SOLUTIONS FOR COMMERCIAL VEHICLES.

SUSTAINABLE. ECONOMICAL. PIONEERING.



Proximity to the customer, developing visions, overcoming challenges and driving forward innovations: Those are our key strengths, that's what has made us what we are today.

COMMERCIAL VEHICLE EXPERTISE

SHAPING THE FUTURE. WITH ELRINGKLINGER.

Our product range includes lightweight components, battery and fuel cell technology, electric drive units, gaskets, shielding systems, transmission control plates, dynamic precision parts, components made of high-performance plastics, tooling technology, and development services. For sustainable mobility – worldwide.



Trucks, semitrailers, buses, vans, fire trucks, ambulances, construction and municipal vehicles ... The purposes for which commercial vehicles are used are many and varied, and so are the requirements that have to be met. One thing is certain: The profound change in the automotive industry will not stop at commercial vehicles. The mobility of the future must be environmentally friendly, because limiting global warming is one of the greatest and most urgent tasks facing the global community. This is why there is a special focus on alternative drive systems for commercial vehicles: E-fuels, gas engines, hybrid solutions, overhead line drives, battery electric vehicles or hydrogen-based fuel-cell commercial vehicles. What's clear is that everyday suitability, tonnage, safety, performance, economy and range must all be right. The automotive supply industry is being called on to provide intelligent and innovative concepts.

SYSTEMS EXPERTISE WITH VISION

ElringKlinger has been quick to respond to these new challenges and offers pioneering solutions in all product areas. As an expert engineering partner and series supplier, we always focus on the vehicle system as a whole. Our particular strength is that we develop and manufacture technologically sophisticated components for all types of drive system. In addition to the electrified or conventional drive, our products can be used in the chassis, underbody, braking system, bodywork and interior.

ElringKlinger's core competencies include stamping, embossing, forming and coating metal, plastic injection molding, processing high-performance plastics, and toolmaking. This is complemented by extensive expertise in combining a large number of different components into a single assembly with high process reliability. As experienced problem solvers, we develop the optimum product for every application. Together with our customers, we work to make the commercial vehicle generations of today and tomorrow powerful, safe, efficient and climate-friendly. We think beyond boundaries and create scope for achieving goals faster and further advancing sustainable mobility.

FROM VISION TO REALITY

E-MOBILITY AS A MEGATREND.

As a specialist in e-mobility, we offer practice-tested battery storage systems and modules alongside various battery components. With our joint venture EKPO Fuel Cell Technologies, we are regarded as a leading full-service supplier of fuel cell stack modules and components. Together with hofer powertrain, we are also a system partner for electric drive units.

If ambitious environmental and climate protection targets are to be achieved, as agreed by the global community in the Paris Climate Agreement, emissions from road traffic must be significantly reduced, among other things. Individual and commercial mobility must be redefined, and climate-friendly drive technologies are at the top of the agenda.

ElringKlinger has been working on alternative drive concepts for more than 20 years and was quick to position itself as a specialist in e-mobility. We are a Group with global operations and actively meet our responsibilities towards the environment and society – both in terms of products and production. Our aspirations are high as a consequence: to drive forward innovations, set standards, and help shape the technological transition with high-performance and high-quality components and systems. This also applies in particular to the commercial vehicle segment.

EXPERTISE MEETS FUTURE FIELDS

Batteries and fuel cells are the crucial technologies for powertrain electrification. In both of these fields, ElringKlinger offers the development and manufacturing expertise necessary to supply matured systems and components that are fit for series production – and to do so in an extremely flexible manner: designed to meet individual customer requirements or based on standardized products and systems, as modular solutions or individual components. We are convinced that battery and fuel cell technologies complement each other and that both are necessary for sustainable mobility. Through our joint venture, hofer powertrain products, we also develop and produce highly efficient electric drive units for hybrid and pure e-vehicles.

GOOD TO KNOW

Our product areas of lightweight/elastomer technology, sealing technology, dynamic precision parts, and shielding systems deliver tailored solutions for the entire vehicle – and for all drive types.



The transformation seen within our industry is gaining considerable momentum. ElringKlinger holds a formidable position when it comes to pursuing the mega trend of electromobility, both in battery and fuel cell technology. Drawing on our portfolio, we are actively shaping the process of transformation in the mobility sector, which includes reducing emissions, spearheading new drive technologies, and making conventional modes of transport more efficient.



SUSTAINABLE SOLUTIONS – AS SERIES

BATTERY TECHNOLOGY.

An efficient energy storage device is a key piece of technology for sustainable electric vehicles. ElringKlinger offers complete lithium-ion battery storage systems and modules for drives and auxiliary power units, as well as various individual components. Intelligent, flexible, absolutely reliable, and proven in practice. We have been a series supplier in battery technology for more than 10 years.

Module based on cylindrical cells.



BATTERY MODULES

Our modules are extraordinarily variable and flexible and can be tailored precisely to our customers' needs, for instance with built-in monitoring electronics. Cylindrical and prismatic cells are used, and pouch cells will soon be available as well. In extensive test runs, we determine safety and compatibility with common tests such as UN38.3 and LV123.

EK standard storage 54 kWh, 400 V.



BATTERY SYSTEMS

ElringKlinger's battery modules can be interconnected to form complete systems of up to 800 V system voltage, which is particularly important when it comes to peak loads in the commercial vehicle sector. Our modular approach permits a wide variety of configurations with storage sizes ranging from 2.2 to 70 kWh. This means that both standardized and project-specific, purpose-designed battery systems can be implemented. Another plus point is that the prototype solutions available at short notice allow our customers to quickly gain some initial experience on test rigs and test tracks, thereby accelerating development times.

Cell contact system for prismatic cells with flexible PCB as signal carrier.



CELL CONTACT SYSTEMS

Our specifically matched cell contact systems in various configuration levels can be placed and welded directly onto the cell cluster. Their plastic carrier frame accommodates the cell connectors and ensures that they can be installed in all tolerance positions. In addition to built-in voltage and temperature sensors, the monitoring electronics (CSC) can also be integrated. Automotive plug systems or screw connectors can be used for the electrical connection outside.

The continuous further development of the safety elements for overpressure, excessive temperature and excessive current provides an outstanding level of safety even at cell level.



CELL HOUSINGS AND COVERS

The exceptional reliability of ElringKlinger's cell housings, even in large volumes, is based on our experience with high-volume production and our expertise in sealing and forming technology as well as joining processes. Our novel cell cover design makes it possible to significantly reduce the number of components and complexity as well as the amount of material used, resulting in a reduction of our carbon footprint by up to 40 percent.

Our BMS is made up of the battery management unit (BMU), current measurement device, and cell sensor circuit (CSC).



BATTERY MANAGEMENT SYSTEMS (BMS)

ElringKlinger can design and produce CSCs for different cell formats and configurations. The BMU's master-slave capability allows up to eight battery packs to be interconnected to form a system. The central control unit of the vehicle only communicates with one BMU. Extensive parameterization options allow the BMU to be flexibly adapted to customer requirements.

The integrated emergency degassing function ensures rapid, controlled pressure equalization in the event of a battery cell degassing.



PRESSURE EQUALIZING UNITS

Pressure differences in the storage casing that occur during uphill and downhill travel, for example, as a result of temperature differences, and also during air transport in air freight chambers without pressure equalization, are equalized by our pressure equalization elements with integrated safety function.

DRIVING THE MOBILITY TRANSITION

FUEL CELLS BY EKPO.

EKPO Fuel Cell Technologies GmbH is a joint venture between ElringKlinger and Plastic Omnium. Our fuel cell stack modules and components meet the highest of demands in terms of performance, economy and reliability. For large-scale production, we use highly efficient automated production processes that have been fully audited and are of proven automotive quality.

PEMFC STACK MODULES

A fuel cell stack is a stack of cells consisting of numerous bipolar plates, membrane electrode assemblies, seals and end plates, and the clamping system. Production-ready stack modules from EKPO include additional system functionalities in the form of a special media supply assembly, which significantly simplify integration into customer systems and result in a compact design. We also have the highest power density (up to 6.2 kW/l for the cell block) on the market. With three different platforms, we cover a power range from 16 to 205 kW_{el}.

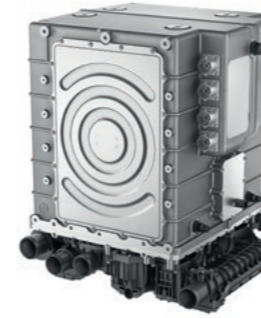
OUR STRENGTHS:

- + High power density
- + Compact design and low weight
- + Robust and reliable technology
- + Low hydrogen consumption for reduced operating costs and longer ranges
- + Automated production processes in line with current automotive standards
- + Simplified system integration thanks to assured quality and comprehensive documentation
- + Advanced system functionalities already integrated

GOOD TO KNOW

The portfolio includes both powerful standard solutions and customer-specific developments for every integration level.

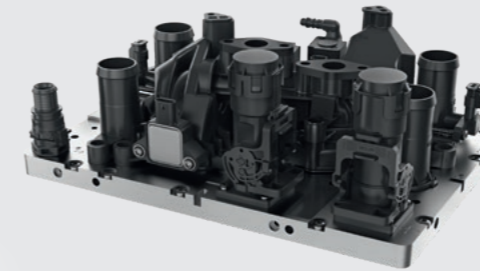
PEMFC stack module NM12 Twin (598 cells, 205 kW_{el}) for applications with high power requirements (> 150 kW) in the heavy-duty, rail and marine sectors.



PEMFC stack module NM12 Single (359 cells, 123 kW_{el}) for the automotive and rail sectors.



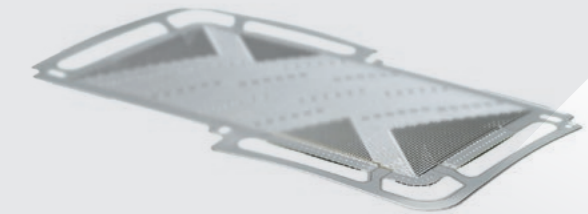
PEMFC stack module NM5-EVO (up to 335 cells, up to 76 kW_{el}) for the automotive sector (light commercial vehicles and passenger cars) in high quantities.



Integrated system functionalities include: valves, sensors, water separators, media interfaces, electrical interfaces, and bypass and cooling channels.

MEDIA SUPPLY ASSEMBLIES

EKPO realizes highly complex modules by injection molding in compliance with the most stringent tolerance requirements. The integration of various functions significantly simplifies the overall system. As a next step towards a highly integrated stack module, additional interfaces for integration of system components adjacent to the module are provided.



Essential components for PEMFC stack modules: metallic bipolar plates from EKPO

BIPOLAR PLATES

PEMFC bipolar plates made of metal offer clear advantages in terms of cost efficiency, power density, and cold-start capability of fuel cells. Using high-precision progressive tooling, EKPO produces metal bipolar plates in a fully automated, interlinked manufacturing process.

DRIVING FORCE FOR E-MOBILITY

EDUs FROM HOFER POWERTRAIN PRODUCTS.

Strategic partners ElringKlinger and hofer powertrain jointly develop and produce highly efficient electric drive units (EDUs). Customized solutions are implemented under the hofer powertrain products brand: high-volume or small-scale production, complete system or integration of individual modules, standard system or individually configured.

BUNDLED EXPERTISE

Our range covers everything from solutions for high-volume production to small batches for standard applications or deployment in the luxury and performance segments. In addition to e-engines, gearboxes, and power electronics, this also includes control software, thermal management, and safety concepts. Taking a holistic view of the entire powertrain allows all potentials to be exploited in terms of costs, quality and efficiency.

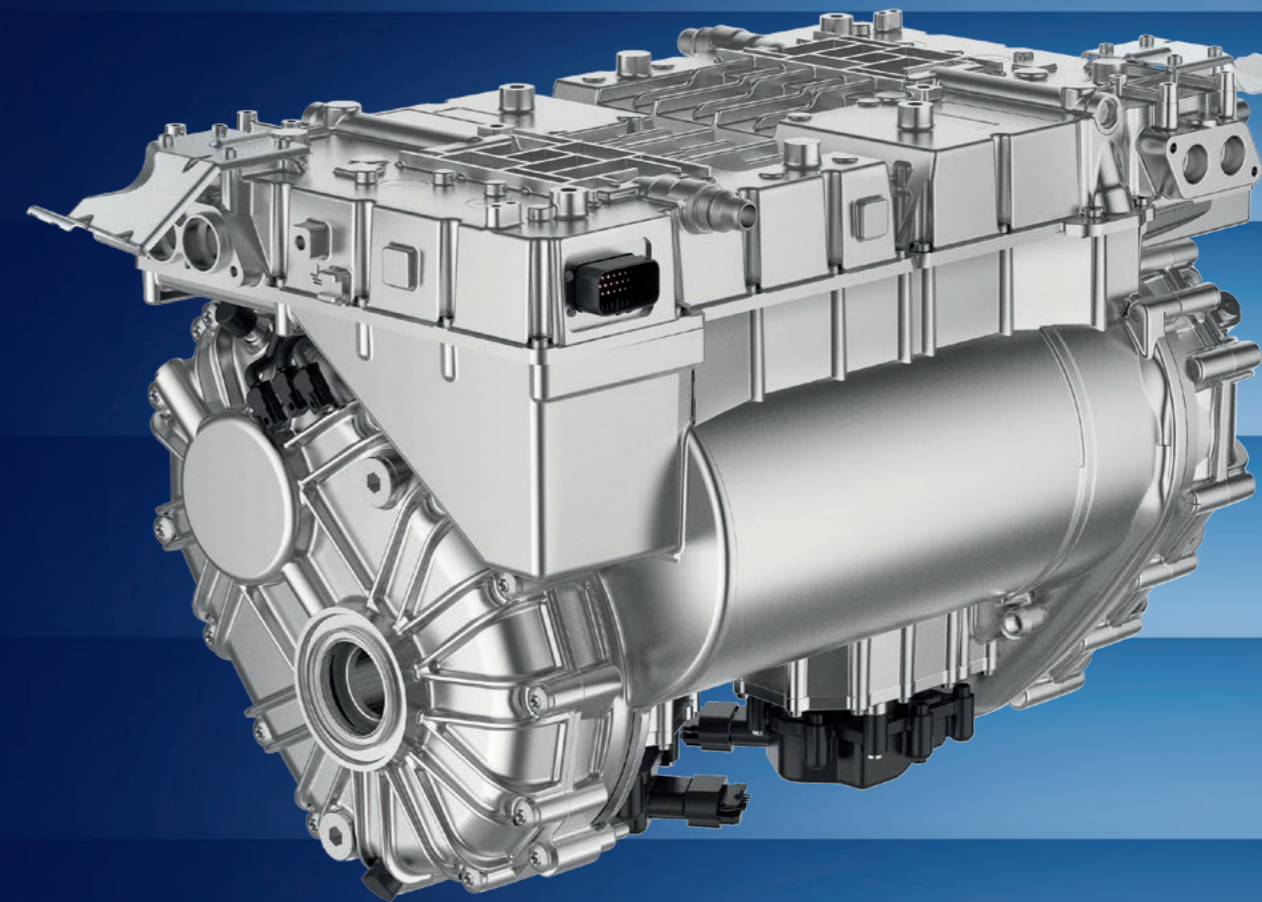
VARIABLE DRIVE ARCHITECTURE

Thanks to our comprehensive expertise in all drive components, we are able to offer complete systems or integrate customer-supplied components into an overall concept and harmonize everything perfectly. Flexible, economical, energy efficient.

EDU CONFIGURATIONS

Whether coaxial, axially parallel, with or without disconnection clutch, our EDUs can be individually configured and are also ideally suited as a standard solution for many requirements. Our customers benefit from the combined expertise of ElringKlinger and hofer powertrain when it comes to the development and global volume production of alternative drive technology.

We offer the right e-axle for every class of commercial vehicle.



We offer various electric drive units under the hofer powertrain products brand, such as the High Compact Torque Vectoring EDU.

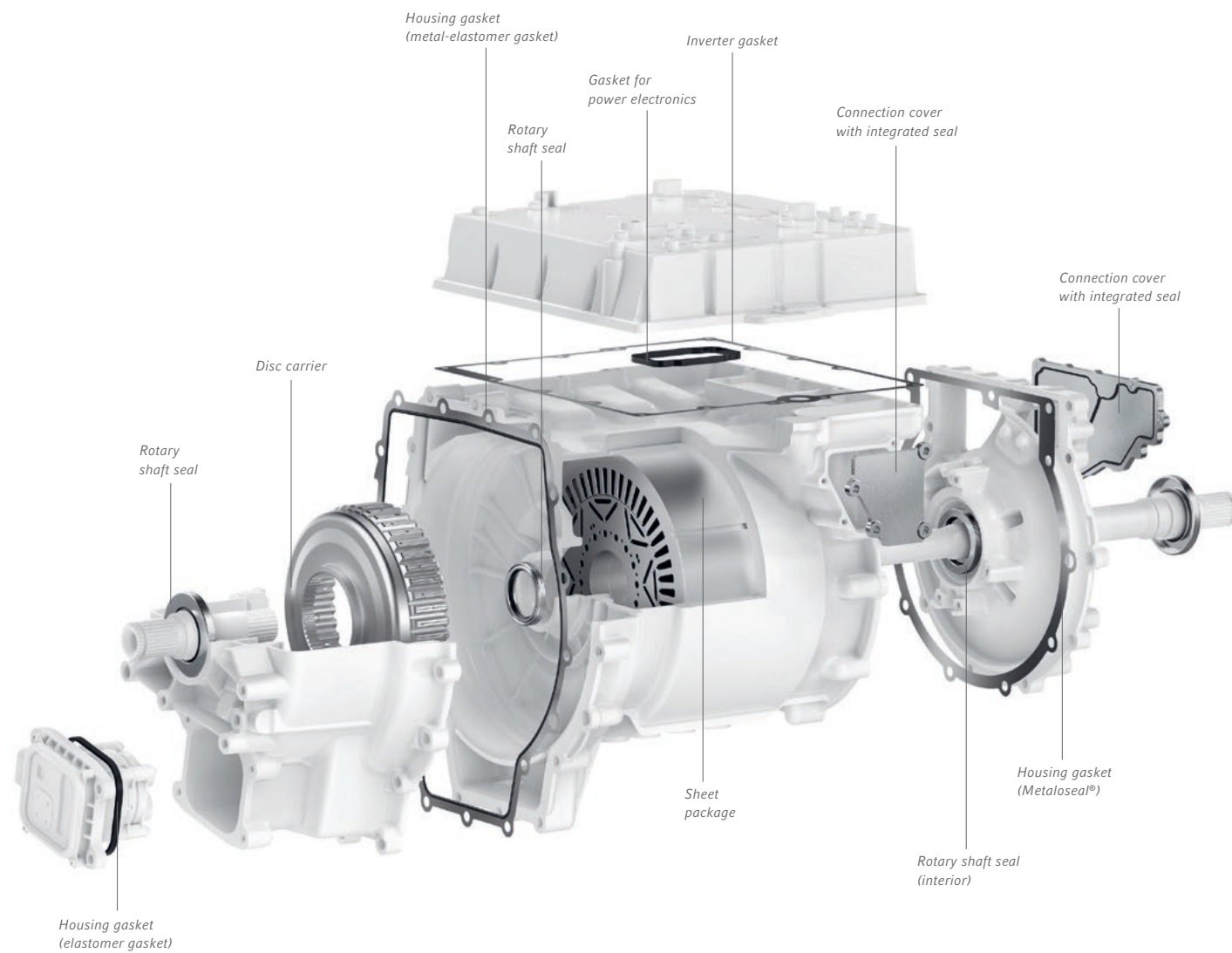
HIGH COMPACT TORQUE VECTORING EDU

This EDU combines two independent drives in a single transmission housing – enabling active torque vectoring, so that the speed per wheel can be accelerated or decelerated depending on the driving situation. The intelligent combination of a planetary and a spur gearhead creates a very compact EDU design with a high power density. Thanks to this design, this EDU version can be easily integrated into various vehicle platforms and is mainly used in high-performance vehicles or all-wheel drive systems.

EXPERTISE FOR THE TRANSFORMATION

COMPONENTS FOR ELECTRIC DRIVE UNITS.

A wide range of ElringKlinger components relating to e-engines, transmissions and inverters can be used in an electric drive unit (EDU). These include function-integrated housing covers, housing seals, rotary shaft seals, disc carriers and sheet packages.



The design and materials of all our product solutions are tailored precisely to the relevant requirements – for maximum design freedom and functional reliability.

DRIVE COMPONENTS FOR DEMANDING REQUIREMENTS

DYNAMIC PRECISION PARTS.

Disc carriers, planetary carriers, sheet packages, differential housings or brake disc carriers from ElringKlinger are mainly used in the gearbox, powertrain, and braking system of vehicles with electric engines, hybrid technology, or combustion engines. Efficiently produced, supplied ready for installation, of the highest quality, and with a weight reduction of up to 50 percent.

HTMC FROM ELRINGKLINGER

The “High Torque Mechanical Connection” (HTMC) technology specially designed by ElringKlinger plays an important role in the production of our dynamic precision parts disc carriers, differential housings and planetary carriers. This is a particularly efficient and economical mechanical connection for high torques, and its mechanical positive-locking fit means that welding processes and the associated thermal effects on the component can be avoided.



Disc carriers

Ready-to-install disc carriers from ElringKlinger offer a high degree of stiffness as well as maximum precision and functional reliability. They also offer weight savings of up to 50 percent compared to conventional solutions.



Sheet packages

Due to our innovative manufacturing processes, the required package height can be achieved with fewer punching strokes, and there is also the option of using thinner sheets for even more efficient e-machine operation.



Differential housings

The molded sheet design results in significant cost and weight reduction in high torque applications.



Planetary carriers

ElringKlinger is implementing a new approach here, integrating the planetary gears into a formed sheet metal part. The benefits: weight and cost savings, high torques and rotational speeds as well as a longer service life for the gears.



Brake disc carriers

For high-performance brakes: Our brake disc carriers are characterized by high functional reliability, low weight and optimum mechanical stability.

OUR COMPETENCE IN THE FIELD OF COMMERCIAL VEHICLES.



Modern commercial vehicles are fitted with a large number of ElringKlinger components. Some of these possible applications are illustrated overleaf.



ELECTRIFIED DRIVE

FUEL CELL TECHNOLOGY

incl. complete PEMFC modules with peripheral components

ELECTRIC DRIVE UNITS

with the following four variants: coaxial EDU, offset EDU, high performance torque vectoring EDU, and high compact torque vectoring EDU

LIGHTWEIGHT/ELASTOMER TECHNOLOGY

e.g. motor and power unit mounts

BATTERY TECHNOLOGY

including lithium-ion battery modules and energy storage systems for drives and auxiliary power units

DYNAMIC PRECISION PARTS

especially disc carriers, sheet packages, differential housings and planetary carriers

DEVELOPMENT SERVICES

of ElringKlinger Motortechnik GmbH

SEALING SYSTEMS

for example, elastomer and metal-elastomer gaskets for large and very large battery housings, deep-drawn covers with sealing such as inverter or service covers, Metaloseal™ housing seals and ElroSeal™ rotary shaft seals for electrical engines, actuators and compressors

SHIELDING SYSTEMS

e.g. ElroShield™ EV as housing or for component protection, also for ElroActive™ hybrid drives for (pre-)conditioning of catalytic converter/particulate filter/SCR systems by means of electrical heating of exhaust gas components including shielding system



CONVENTIONAL DRIVE & EXHAUST SYSTEM

LIGHTWEIGHT/ELASTOMER TECHNOLOGY

including plastic modules, e.g. oil pans, oil separation systems, dry sump oil tanks, cylinder-head covers and transmission pistons

SEALING SYSTEMS

for example, metal-elastomer or Metaloflex™ cylinder-head gaskets, Metaloseal™ gaskets (e.g. for exhaust gas recirculation including rescue filters), transmission control plates, metal-elastomer gaskets (e.g. for the crankcase), elastomer gaskets (e.g. for the intake manifold, coolant applications or oil pans), transmission composite pistons and spring energized PTFE seals for media separation in high-pressure injection pumps

SHIELDING SYSTEMS

ElroShield™ S, M or D for thermal and acoustic protection of components, e.g. on the exhaust manifold or turbocharger

DYNAMIC PRECISION PARTS

especially disc carriers, planetary carriers, and differential housings

DEVELOPMENT SERVICES

of ElringKlinger Motortechnik GmbH

BODYWORK & INTERIOR

LIGHTWEIGHT/ELASTOMER TECHNOLOGY

e.g. cockpit cross-car beams and front-end carriers/adapters in plastic-metal hybrid technology, as well as door modules, module mounts, seat structures and crash elements in thermo-plastic composite hybrid technology

SEALING SYSTEMS

e.g. memory packings in headlight cleaning systems or in air pumps for active seats, as well as complete pistons in compressors for air suspension systems

SHIELDING SYSTEMS

e.g. ElroCoustic™ trunk covers for noise and vibration damping

CHASSIS, BRAKING SYSTEM & UNDERBODY

LIGHTWEIGHT/ELASTOMER TECHNOLOGY

e.g. underbody shielding made of fibre composites

SEALING SYSTEMS

e.g. PTFE guide bands for brake applications and PTFE membranes for pumps and valve applications

SHIELDING SYSTEMS

incl. ElroShield™ M and S for underbody shielding and ElroCoustic™ wheel arch liners

DYNAMIC PRECISION PARTS

especially brake disc carriers

MULTIFUNCTIONAL, DURABLE, EFFICIENT

LIGHTWEIGHT TECHNOLOGIES.

Lightweight construction is one of the key technologies in the automotive industry. For commercial vehicles in particular, this can lead to significant efficiency gains, such as lower fuel consumption and greater range, as well as a higher available payload. Our systems expertise sets us apart in lightweight plastic construction, and we are proficient in a wide range of manufacturing processes. We also use our expertise in a targeted way for other applications in the field of battery systems, fuel cells and drives.

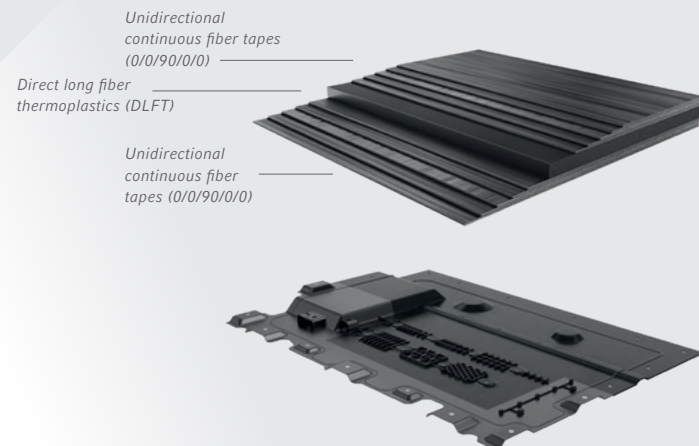
MOBILITY MADE EASY

For us, intelligent lightweight construction is more than just reducing weight. We use lighter materials – fiber-reinforced plastics, thermoplastics and thermosetting plastics, organo sheet materials, and metallic materials such as aluminum and magnesium – in combination with state-of-the-art manufacturing processes. This opens up the possibility of increased functional integration, with the resulting benefits for the customer in terms of a reduction in the total number of parts. Apart from saving weight and material, this also reduces development times and costs. Customized lightweight components from ElringKlinger can be used anywhere in the vehicle, for example cockpit cross-car beams, door modules, underbody shieldings, and engine mounts.

INTELLIGENT LIGHTWEIGHT CONSTRUCTION FROM ELRINGKLINGER

- + Reduced use of materials
- + High cost effectiveness
- + Integration of numerous functions
- + Functional testing of the entire module
- + Improved NVH characteristics

- + Design freedom
- + Shorter development times
- + Reliable, easy assembly
- + Recyclability
- + Resource efficiency



ElroSafe™: innovative underbody shielding for battery systems made from a thermoplastic material composite; conventional shields are made of aluminum.

PRESSING AND FORMING TECHNOLOGY

This is where various composite materials are combined in a sandwich design. These cost-effective and weight-optimized components have a high degree of strength, rigidity and toughness combined with low density and low wall thickness. They are used for thermal and acoustic shielding, as well as in areas with particularly high requirements, such as underbody shielding for battery or hydrogen-powered vehicles. Other plus points: high damage tolerance and heat resistance (fuel fire test, thermal propagation), electrical insulation, and recyclability.

Functional elements such as the window winder and locking system are attached to this door module carrier, which is fitted in the vehicle door.



Cockpit cross-car beams from ElringKlinger combine maximum functionality with minimum weight. The support structure accommodates the instrument panel, steering column, heating and ventilation modules, airbags and other components and connects them securely to the chassis.



Our high-performance plastic components, such as oil pans, also withstand the particularly high mechanical stresses in the commercial vehicle sector.



THERMOPLASTIC COMPOSITE HYBRID TECHNOLOGY

Our lightweight components made of continuous fiber-reinforced thermoplastics are as strong and resilient as metal. They can be used wherever weight needs to be saved in structural and energy-absorbing components. The benefits: short cycle times, downstream welding and gluing processes possible, various material combinations possible (woven or unidirectional continuous fibers in combination with different thermoplastic matrix materials).

PLASTIC-METAL HYBRID TECHNOLOGY

These structural components (polymer-metal hybrids, PMH) offer high rigidity with low weight and also fulfil the crash performance requirements. The load path-based design allows additional metal components made of magnesium, aluminum or steel to be inserted into areas subject to high stresses. The plastic injection molding process makes it very easy to integrate additional functions, such as local fixation points.

PLASTIC INJECTION MOLDING AND ELASTOMER TECHNOLOGY

From engine, transmission and power unit mounts to cylinder-head cover modules, ladder frames, oil pans and charge air components, lightweight plastic components from ElringKlinger offer decisive advantages thanks to our decades of experience in the processing of thermoplastics: weight reduction, multi-function integration, cost saving potential, improved NVH characteristics, low thermal conductivity, high dimensional accuracy, high process stability and repeatability.

MASTERS EVERY CHALLENGE

SHIELDING TECHNOLOGY.

ElringKlinger offers the right shielding systems for every application point throughout the entire commercial vehicle in terms of temperature management, acoustic behavior, vehicle safety, electromagnetic compatibility and aerodynamics. For more safety, convenience, economy and environmental protection.

ELROSHIELD™ M AND S

ElroShield™ M consists of several layers (metal, insulating material) and is suitable for a wide range of applications up to an operating temperature of 1,100 °C. Besides the primary thermal protection function, acoustic and electromagnetic functions can be added, as well as aerodynamic functions, especially in the underbody area. Add-on components, such as gaskets, cable clips, and fastening and connecting elements can be integrated.

ElroShield™ S is the single-layer variant of this shielding system and is primarily used in areas with lower thermal requirements, such as the underbody area.

The areas of application for ElroShield™ M and S shielding components are many and varied; e.g. exhaust manifold, turbocharger, underbody and cylinder head cover.



ELROSHIELD™ D

ElroShield™ D comes into its own in the case of exacting demands with regard to thermal and acoustic management and in areas in which system temperatures have to be kept constant. A metallic carrier layer is combined with a silicate nonwoven that allows direct contact with the surface of the component to be protected. The shielding part is extremely lightweight, offers highly efficient thermal protection and optimum acoustic absorption on components subjected to high temperatures, and can be used up to operating temperatures of max. 1,100 °C.

ElroShield™ D with direct contact to the component to be protected is used for thermal and acoustic engine encapsulation and on catalytic converters, for example.



ELROACTIVE™

As an active system, ElroActive™ is fitted with heating elements that allow the required operating temperatures for exhaust gas aftertreatment components to be controlled precisely. It can be used flexibly at any position in the exhaust system, right up to the cold end, at operating temperatures of up to 800 °C. There are also potential applications for battery systems, where battery cells or battery modules, for example, can be brought into the optimum temperature range under any ambient temperature using ElroActive™.

ElroActive™ shielding systems actively contribute to greater environmental protection on two levels.



COMPOSITES ELROCOUSTIC™, LWRT AND GMT

Here, various composite materials are combined in a sandwich design, offering very good acoustic shielding properties with low specific weight. LWRT (low weight reinforced thermoplastics) components are used in the engine and underbody areas, for example, while GMT (glass mat reinforced thermoplastics) components are used particularly in areas with increased requirements for strength and crash behavior. The main areas of application for ElroCoustic™ shielding parts include underbody protection, engine compartment encapsulation, and covers of all kinds.

LWRT shielding part: lightweight, multifunctional and with excellent acoustic absorption and damping.



ELROSHIELD™ EV

Based on our many years of experience with the robust, efficient ElroShield™ design and our extensive materials and process expertise, we have developed the innovative ElroShield™ EV shielding system. It is primarily used in battery electric applications as housing and for component protection. The multilayer design made of functional materials offers added value over conventional solutions, especially for electrical and electronic components.

ElroShield™ EV is specialized in the mechanical, thermal, acoustic and electromagnetic shielding tasks for XEV applications.



ELROSAFE™

The underbody protection for battery systems must reliably withstand roadside impact loads and offer outstanding thermal and acoustic insulation. ElroSafe™ components made of thermoplastic fiber composites offer crucial advantages here compared with conventional aluminum battery bases. The potential of this material system can also be exploited for other lightweight applications, such as bulkheads and rear bumper brackets.

Maximum safety for battery bases with ElroSafe™ from ElringKlinger (see also page 20).



TAILORED, INNOVATIVE, HIGHLY EFFECTIVE

SEALING SYSTEMS.

Whether electric motor, hybrid technology or traditional drive: ElringKlinger covers the numerous sealing tasks in engines, transmissions, exhaust systems, electric drive units, auxiliary units and in the bodywork and chassis area with precisely coordinated, efficient sealing systems. Safe and reliable even under the toughest conditions.

ABSOLUTE RELIABILITY – FOR ALL DRIVE TECHNOLOGIES

Our customized sealing systems are as diverse as their possible application points. Materials and designs are perfectly matched to the particular requirements involved. What's more, it is possible to integrate additional functions such as heat shields, filters, sensors and pre-assembly elements.

The benefits: fewer individual components, less installation work, reduced weight, lower costs, and optimized operation.

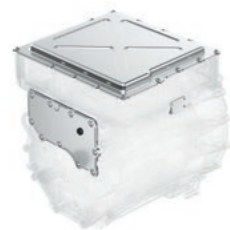
Oil pan gasket with optimized bolt force distribution.



Metal-elastomer gasket for the crankcase; consisting of various metal segments connected by way of the elastomer sealing lip.



Topseal inverter cover (top) and service cover: housing parts with topographic support of the integrated gasket.



METAL-BEAD GASKETS METALOSEAL™

This highly effective sealing system is based on metallic carrier materials plus elastomer function coatings. One of the great advantages of Metaloseal™ is its adaptability: different metals can be combined with different elastomer types, precisely aligned to the relevant application. Highly elastic with minimum assembly forces.

ELASTOMER AND METAL-ELASTOMER SEALING SYSTEMS

Whether with or without metal carrier material, both gasket designs stand for optimal function reliability and efficiency. The special feature: ElringKlinger develops the elastomer materials used in-house. Highly stressed components such as electric drive systems, battery storage systems, and engine and transmission components are sealed absolutely reliably, even at low sealing pressures.

TOPSEAL HOUSING PARTS

With the Topseal sealing system by ElringKlinger, the cover and gasket are combined in a single function unit. Deformation limiters are formed into the metal housing cover to protect the elastomer seal from overpressure and so allow continuous metallic contact between the cover and housing. Topseal thus achieves optimal shielding against electromagnetic radiation and is in particularly high demand in the field of e-mobility.

Mica-based volume sealing ring (left) for use in the area close to the turbocharger. Graphite-based volume sealing ring, preferably used in lightweight flanges or on particularly uneven sheet metal manifolds. A stainless steel carrier provides dimensional stability in both cases.



VOLUMESOFTSEAL HOT GAS GASKETS

The combination of soft materials (mica, graphite) and selected steels makes it possible to create reliable sealing solutions that satisfy the most stringent leakage standards even in highly demanding applications – including at operating temperatures of up to 1,100 °C.

CYLINDER-HEAD GASKETS

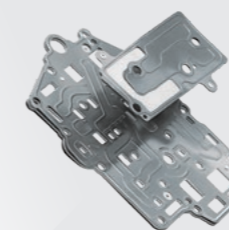
As key components in modern combustion engines, cylinder-head gaskets contribute to an efficient, safe and economical engine operation. The robust, durable metal-elastomer cylinder-head gaskets made of metal carriers with vulcanized elastomer profiles show what they are made of in both commercial vehicle and large engines. The Metaloflex™ design consists of beaded, elastomer-coated spring steel layers and, in addition to passenger cars, is primarily used in vans and light commercial vehicles, as well as in electric vehicles with range extenders.



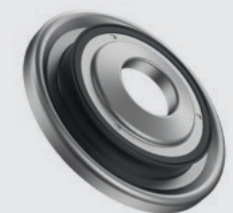
TRANSMISSION APPLICATIONS

ElringKlinger solves the complex sealing tasks in the transmission area with high-performance, customized systems – in hydraulic transmission controls with oil pressures of up to 80 bar or directly in the shift pistons of automatic transmissions at high circumferential speed and millions of switching operations over the service life.

Metaloseal™ transmission control plate: reliable for maximum requirements and the highest operating pressures; with integrated filter function.



Innovative design, optimum hysteresis behavior and maximum reliability: the special feature of ElringKlinger composite pistons is their extremely smooth surface. This ensures that the transmission controller works particularly smoothly.



LEADING THE WAY WITH INNOVATIONS

COMPONENTS MADE OF HIGH-PERFORMANCE PLASTICS.

Our subsidiary ElringKlinger Kunststofftechnik GmbH offers innovative, specifically tailored gaskets and engineered parts made from PTFE, PTFE compounds, PEEK, Moldflon™ and other high-performance plastics. They can effortlessly withstand high pressures, friction, corrosive media, chemicals and other loads, whilst at the same time helping to achieve greater efficiency and reduce the environmental impact.

PLASTICS IN TOP FORM

Our products, such as ElroSeal™ rotary shaft seals, spring-energized seals, support rings, piston rings and guide elements, as well as multi-component injection molded parts, provide greater design freedom and a more economical solution in all sorts of usage locations. These include in particular electric drive systems, combustion engines, transmissions, compressors and electric compressors, ventilation/air conditioning and cooling circuits, brakes, and active chassis and level control.



Electric drive

The demands on sealing components for electric drive systems are high. Our innovative components reliably cope with high pressures and speeds, extreme temperatures, and dry running or insufficient lubrication. Pictured: ElroSeal™ E rotary shaft seal.

Fuel cell mobility

We develop efficient and economical product solutions for new sealing interfaces in alternative drives and fuel cell components. Here, too, ElringKlinger Kunststofftechnik GmbH combines state-of-the-art manufacturing technologies with unparalleled materials expertise and over 50 years of experience. Pictured: ElroSeal™ SP rotary shaft seal.

Powertrain fuel

In commercial vehicles, too, it is important to exploit the full potential of modern engines in terms of emission, consumption, and performance optimization. Extreme temperatures, pressures, corrosive media and other stresses have to be overcome. Our components made of high-performance plastics take even the most exacting demands in their stride. Pictured: spring energized seals.



Thermal management

Lifelong tightness, safety, and functionality in a wide range of operating conditions: Our high-performance components ensure that circuits are sealed efficiently, thereby helping to reduce CO₂ emissions. Pictured: thermal management seal.

Active safety systems

With their uncompromising quality, our solutions made of high-performance plastics reliably and economically ensure the proper operation of brakes, compressors, sensors, cable guides, and actuators. Pictured: sealing rings.

Compression & regulation

Ideal pressure control results in optimal emission reduction. Our seals help to extend or eliminate service intervals through their sustainability in terms of service life and durability. Pictured: spring energized seals.

PARTNER FOR DEVELOPMENT AND TESTING

ELRINGKLINGER MOTORTECHNIK GMBH.

Engine testing, development, engine trials, engine tests and the optimization of engines, exhaust tracts, hybrid and electric drives are among the services offered by our subsidiary ElringKlinger Motortechnik GmbH. Carried out in the vehicle laboratory, on modern dynamic test rigs, and in test driving on roads. For maximum safety, efficiency, and reduced development times.

ICE TEST RIG

- + Functional tests, endurance runs, special measurement technology
- + Engine controls calibration
- + Engine cold start optimization
- + Thermal management and combustion process development
- + Thermal shock testing
- + Development of exhaust aftertreatment systems
- + Vehicle laboratory
- + RDE measurements and Euro 7
- + Hybrid drive testing
- + NO_x and particulate emissions in RDE test mode

4 X 4 TEST RIG WITH CLIMATE CHAMBER

- + For commercial vehicles up to 5 metric tons (ICE, HEV, BEV, FCEV)
- + Every wheel controllable separately (torque vectoring)

HYDROGEN-ICE TEST RIG

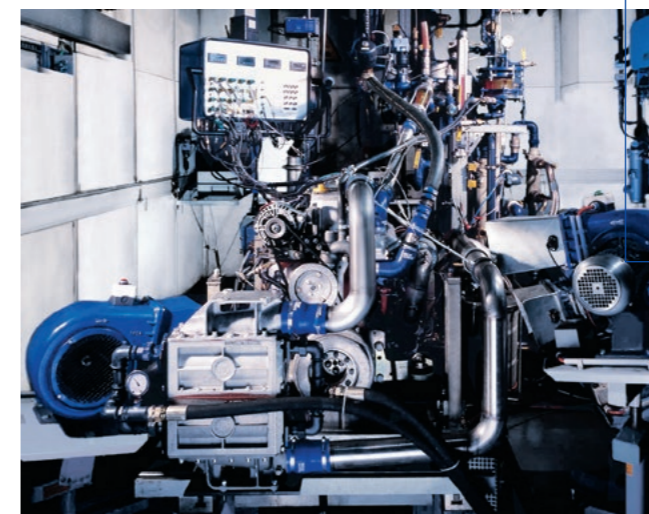
- + For light- and heavy-duty applications
- + Up to 650 kW and 3,600 Nm

PEMFC STACK TEST RIG

- + For power classes up to 150 kW



ELRINGKLINGER MOTORTECHNIK GMBH HAS STATE-OF-THE-ART ENGINE TEST RIGS FOR CARRYING OUT DEVELOPMENT PROJECTS, FUNCTIONAL TESTS AND ENDURANCE TESTS: FULLY AUTOMATED, STEADY-STATE AND DYNAMIC – WITH A FULL DEVELOPMENT ENVIRONMENT.



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