

eMobility

Pioneering Solutions from High-Performance Ceramics

CeramTec
THE CERAMIC EXPERTS

The objective is to ensure mobility through environmentally friendly, sustainable and yet economically efficient technologies. As a partner of the international automotive industry, CeramTec actively drives eMobility developments and uses its comprehensive automotive competence in the field of technical ceramics to offer innovative solutions for all types of drive concepts – from optimising combustion engines and hybridisation, to pure electromobility and providing the required infrastructure. Innovations need creative minds, new thinking and extremely powerful, exceptional materials: high-performance ceramics from CeramTec. Pointing the way to the future.

High-performance ceramics: the material for innovative eMobility solutions

The development towards electrification and eMobility presents growing challenges for automotive manufacturers, suppliers, energy producers, infrastructure partners and the manufacturing industry. The further development of alternative drive technologies and new systems for production, storage, transmission and distribution of energy has to be pursued at full speed. The electrical infrastructure for mobile and stationary applications has to be created. These complex tasks require materials which meet extreme requirements. Innovative high-performance ceramics from CeramTec provide a crucial contribution to progress:

- Together with customers, we develop technical ceramics solutions which have unique functionalities and a customised characteristics profile to allow visionary concepts.
- They are superior where conventional materials such as metal and plastic reach their limits.
- They support more environmental protection, economic efficiency, safety, durability and user comfort.
- They provide more efficiency and productivity in manufacturing processes.
- They are hard to replace in many applications, such as electrified transport vehicles, charging stations, energy generation, energy storage and energy distribution.
- Solutions from CeramTec cover the entire range of eMobility applications: from cars, eBikes, Segways and eMotorcycles to aeroplanes and other electrically driven mobility solutions – on land, on water and in the air.

Fields of application for high-performance ceramics

Technical ceramics from CeramTec are used in numerous areas of application: In sensor systems, our sensor components capture and process a variety of values with high precision. In power electronics, ceramic high-performance materials and solutions meet a variety of requirements with a high level of reliability, even under immense demands. For temperature management, high-performance ceramics from CeramTec ensure optimum thermal dissipation and insulation. For fluid and gas regulation, ceramic components from CeramTec help to ensure a high level of reliability. Our technical ceramics play a key role wherever electrical insulation is

required. In all types of bearings, our solutions play out their strengths in the long term. Our materials exhibit immense resistance in the handling of aggressive media. Whether innovative design solutions, lightweight design concepts and miniaturisation, material reinforcement, applications in sound management or efficient production processes – the unique range of properties of high-performance ceramics from CeramTec offers crucial added value and benefits in all these areas.

HIGH-PERFORMANCE CERAMICS*: POWERFUL FOR EMOBILITY

- Electrical insulation
- High dielectric strength
- Electromagnetic compatibility (EMC)
- Freedom from partial discharge
- High thermal conductivity
- Corrosion resistance
- Thermal insulation
- High heat resistance
- Low friction
- Chemical resistance
- Impact resistance
- Wear resistance
- Low weight
- UV resistance
- Resistance to temperature shock
- Transparency

* Depending on the material, advanced ceramics have different properties

CeramTec – competence in eMobility

Piezo-ceramic discensing elements used within ultrasonic parking assistance systems



Cyrol® ceramic bearing roller elements for wear-resistant, electrically insulating bearings and preventing electro-pitting



Integrated membranes for pressure sensors in brake control systems, gearbox controls and other sensor applications



Preforms for material reinforcement and for lightweight design



Switching spark gap for xenon lights



Piezo-ceramic sensors for flow rate and fill level detection



Ceramic bearings for control valves



Substrates as hybrid circuit for control devices, e.g. gearbox control



Electrical insulation components in PTC high voltage heaters for interior heating or fluid heating



SOEC fuel cell components for producing CO₂-neutral fuels



Ceramic elements for regulating and dosing fluids



Ceramic bearing elements for durability and wear resistance under rough conditions



Piezo-ceramic sensor components for flow rate and fill level detection in fluids to airbag detection systems



Resistor cores for resistors in electronic circuits



Inductor Cores for Inductors in electronic circuits



Power electronics

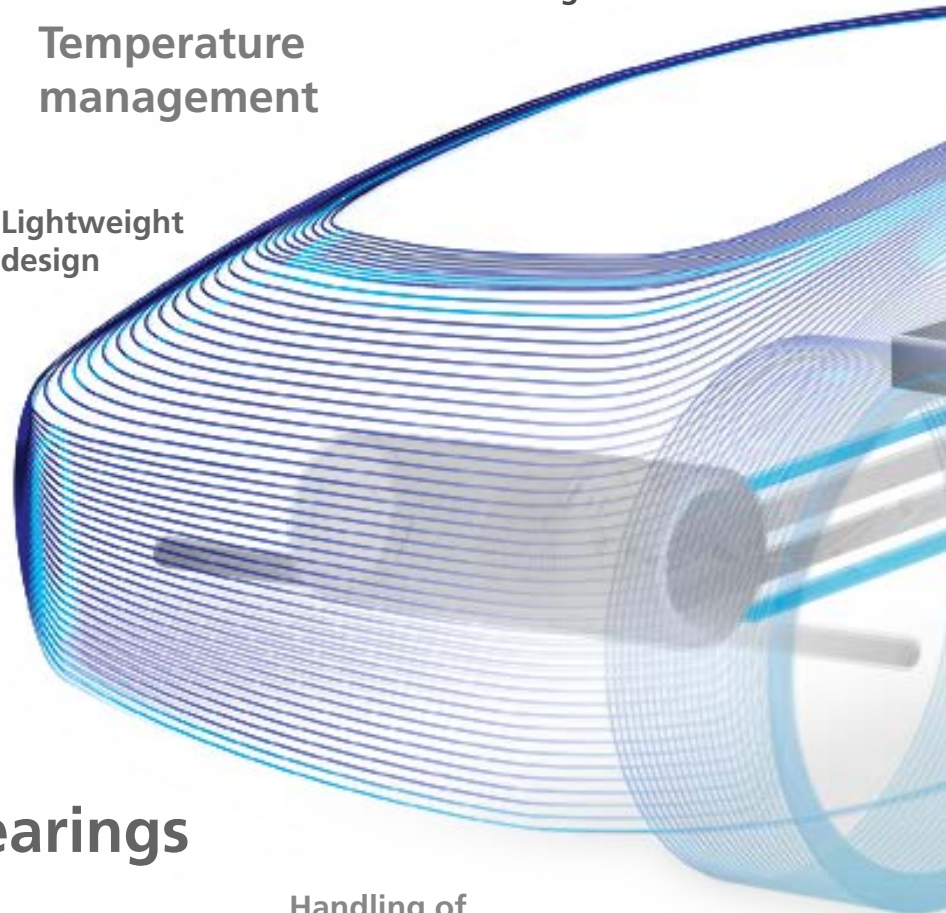
Sound management

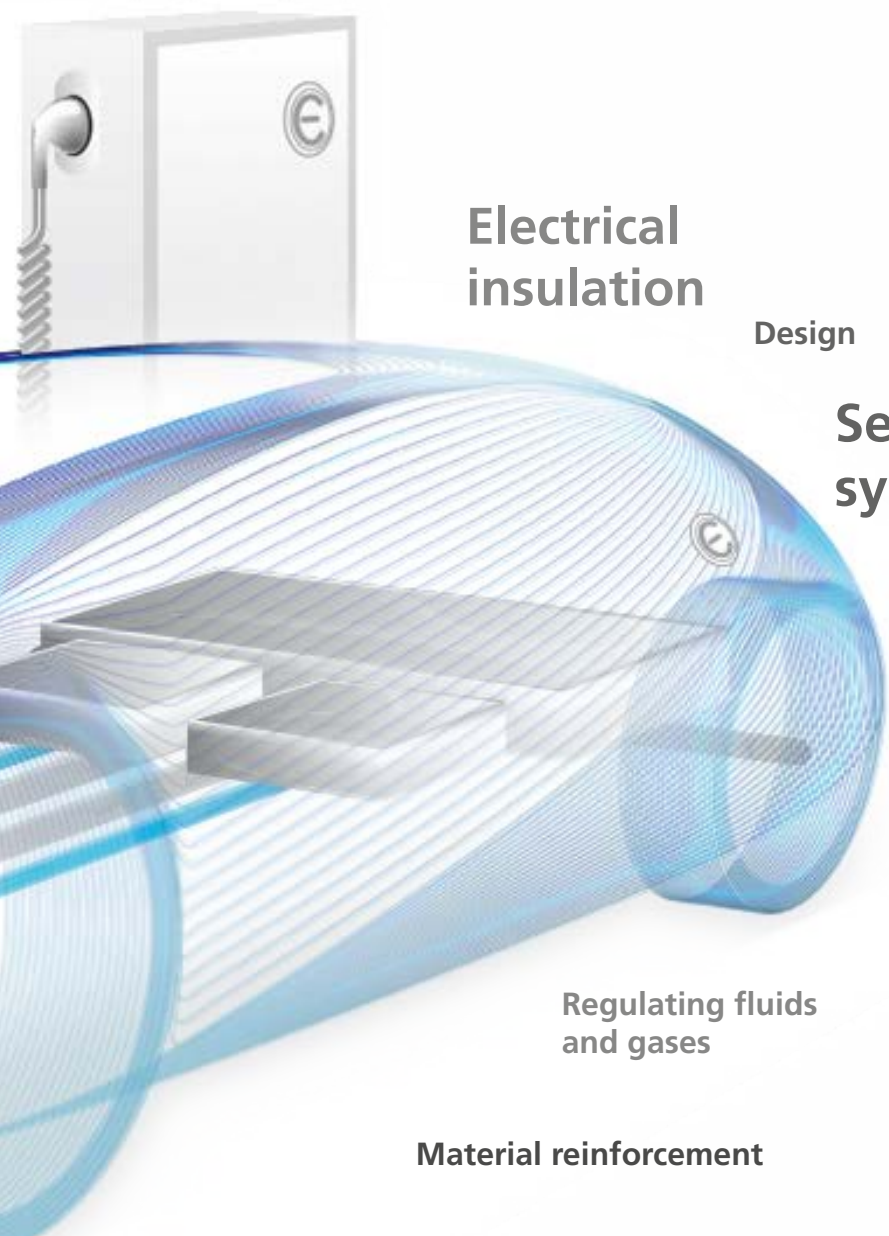
Temperature management

Lightweight design

Bearings

Handling of aggressive media





Electrical
insulation

Design

Sensor
systems

Regulating fluids
and gases

Material reinforcement


Efficient production
processes

Ceramic circuit carriers
for xenon, LED and laser light
technology 


PERLUCOR®
transparent ceramics as pro-
tective glass and design element 


Protective ceramic plates
for vehicle armouring 


Insulation rings
for thermal management in
brake callipers 

**HTCC and LTCC ceramic tape
CeramTape®**
for manufacturing hybrid and
electronic control elements 


Face seals
in coolant pumps 


Socket and insulation tubes
for electrical insulation in
halogen and xenon lights and
for vehicle-independent heaters 


CeramCool®
heating elements for thermal
management in batteries 

CeramCool®
heat sinks for potential
transformers, battery
cooling, drive control and
brake energy recovery 


Components
for electrical insulation in
electric and electronic systems 


Hermetically sealed assemblies
for sensor applications,
connectors and conduits
for electrical systems 

Manufacturing: Casting cores
for complex cast components
with undercuts, channels, etc. 

**Manufacturing: Welding centring
pins and gas nozzles** for MAG
welding in car body making 

**Manufacturing: Risers and
nozzles** for casting engine
and suspension components
and aluminium rims 

**Manufacturing: Tool systems
and cutting materials SPK®**
for turning and milling cast
iron and hardened steel
components 

Manufacturing: Porous cells
for chrome plating 

Manufacturing: Setter plates
for MIM components 

