Pioneering Solutions from Advanced Ceramics

ELECTRONICS
Advanced ceramics: the material for innovative eMobility solutions

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 of hybrid drives to pure electromobility and providing the required infrastructure. Innovations need creative minds, new thinking and extremely powerful, exceptional materials: advanced ceramics from CeramTec. Pointing the way to the future.

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 advanced 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 eCars, eTrucks, eBikes and eMotorcycles as well as locomotives and other electrically driven mobility solutions – on land, on water and in the air.
Electrical insulation components in PTC high voltage heaters for interior heating or fluid heating

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

Piezo-ceramic discsensing elements used within ultrasonic parking assistance systems

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

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

Preflows® 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

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

Ceramic circuit carriers for LED and laser light technology

Inductor Cores® for Inductors in electronic circuits

Protective ceramic plates for vehicle armouring

Insulation rings® for thermal management in brake callipers

Face seals in coolant pumps

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

CeramCool® heat sinks for inverter and converter 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 MAIG 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 manufacturing of MIM-parts

Resistor cores for resistors in electronic circuits

Ceramic circuit carriers for LED and laser light technology

Efficient production processes

Temperature management

Electrical insulation

Lightweight design

Regulating fluids and gases

Sensor systems
Fields of application for 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, advanced ceramics from CeramTec combine 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 or efficient production processes – the unique range of properties of advanced ceramics from CeramTec offers crucial added value and benefits in all these areas.

Hight-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

* Depending on the material, advanced ceramics have different properties