



Heraeus Electronics
Your Reliable Materials Solutions Partner
for Automotive Electronics

The Future of Automotive is AUTONOMOUS. CONNECTED. ELECTRIC.

AUTONOMOUS

By 2030, up to 70% of new cars sold could have self driving features. 15% could be fully autonomous.

- ⊕ Advanced Driver Assistance System (ADAS)
- ⊕ Enhanced safety system

CONNECTED

Connected car technologies will become standard by 2020. Vehicles are increasingly being equipped with built-in network capacity.

- ⊕ Body electronics
- ⊕ Infotainment

ELECTRIC

Global electric car production is estimated to be up to 41 million vehicles in 2040.

- ⊕ Powertrain
- ⊕ Electromobility



Navigating the New Era of Mobility

The automotive industry is transforming at an unprecedented rate - with the rise of the autonomous, connected and electric automotive technologies leading the way in shaping the future of mobility.

Around the world, carmakers and car component manufacturers are expanding existing solutions and accessory offerings to include advanced onboard features such as diagnostic and analytical tools for advanced driver assistance systems; network capacity for enhanced connectivity; safety and powertrain systems for innovation in electromobility.

Heraeus Electronics is the reliable partner for the future of automotive innovation. In close cooperation with OEMs and suppliers, Heraeus Electronics develops innovative materials solutions for the automotive industry. Our customers and partners benefit not only from our comprehensive materials portfolio but also from our application knowledge and service offering, assuring that their cutting-edge components in cars always get a safe connection.

Heraeus Electronics – Your Reliable Materials Solutions Partner for Automotive Electronics

Heraeus Electronics develops and manufactures important materials solutions for the assembly and packaging technology of electronic devices: aluminum bonding wires and ribbons, roll clad strips and stamped parts, metal ceramic substrates, solder paste, sinter paste and thick film paste. When these materials are combined in a single device, complexity increases. The performance and reliability of the devices does not only depend on the performance of each individual material, but also on the interplay of the materials in the end application. This also results in the need for higher integration.

With our broad portfolio and decades of experience in supplying materials to the automotive industry, we dissolve these issues by creating perfectly matched solutions that minimize complexity and compromises. Heraeus Electronics is your partner of choice answering your technical challenges by offering innovative materials, matched materials as well as pre-applied and qualified material systems. Combined with our application knowledge and simulation competence we help you to shorten your development cycles, lower your costs and bring next generation products faster to market.

AUTOMOTIVE TRENDS

connectivity
intelligent & connected
affordable SAFER
comfortable
cleaner &
sustainable

ELECTRONIC PACKAGING TRENDS

Higher efficiency and power density

Cost effective solutions

Miniaturization

High reliable modules for harsh environments

Integration

OUR MATERIALS SOLUTIONS

Assembly Materials

- High reliability solder paste for SMT and semiconductor applications
- Welco® solder paste for fine pitch SiP applications
- mAgic pressure sinter paste for high power density packages

Bonding Wires

- Thick bonding wires for higher operating temperatures and reliability
- Gold bonding wires for best workability and reliability

Substrates

- High reliable AlSi roll clad strips
- Condura® metal ceramic substrates for highest mechanical robustness and reliability

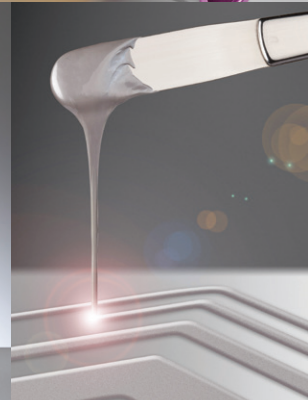
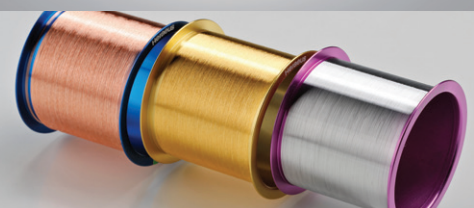
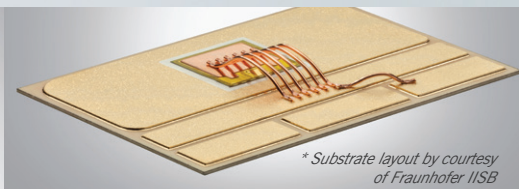


Thick Film Materials

- Polymer thick film technology for sensor and heater applications
- Conductor, resistor, and dielectric pastes for high reliability circuit and component applications

Material Systems & Engineering Services

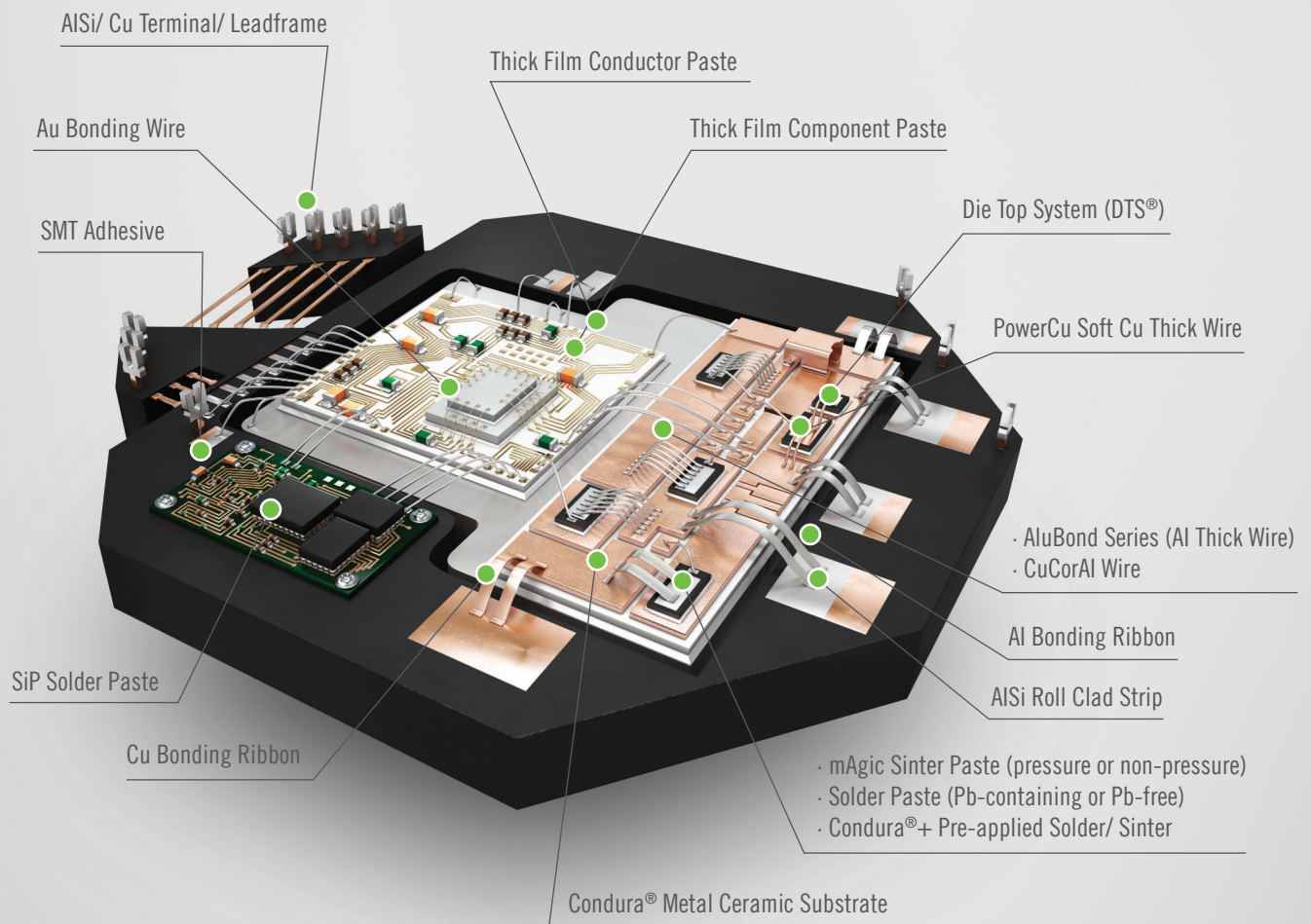
- Die Top System (DTS®) for best performance
- Engineering services to develop customer specific solutions
- Condura®+ pre-soldered metal ceramic substrates for lower cost of ownership and improved throughput yield



Materials Solutions for Advanced Driver Assistance System and Safety Systems

Adaptive cruise control, forward collision warning and autonomous emergency braking are central components in many Advanced Driver Assistance Systems (ADAS) and safety systems. Materials not only have to function reliably in extreme heat but also in other critical harsh environments. Our perfectly matched materials solutions provide the highest levels of reliability and performance for electronic control units.

HERAEUS MATCHED MATERIALS FOR ELECTRONIC CONTROL UNITS





ADAS APPLICATIONS

- Adaptive driving beam
- Cruise and traction control
- Blindspot detective & monitoring
- Lane change assistance
- Collision avoidance systems
- Electronic controls
- Driver alertness
- Forward collision warnings



SAFETY SYSTEMS APPLICATIONS

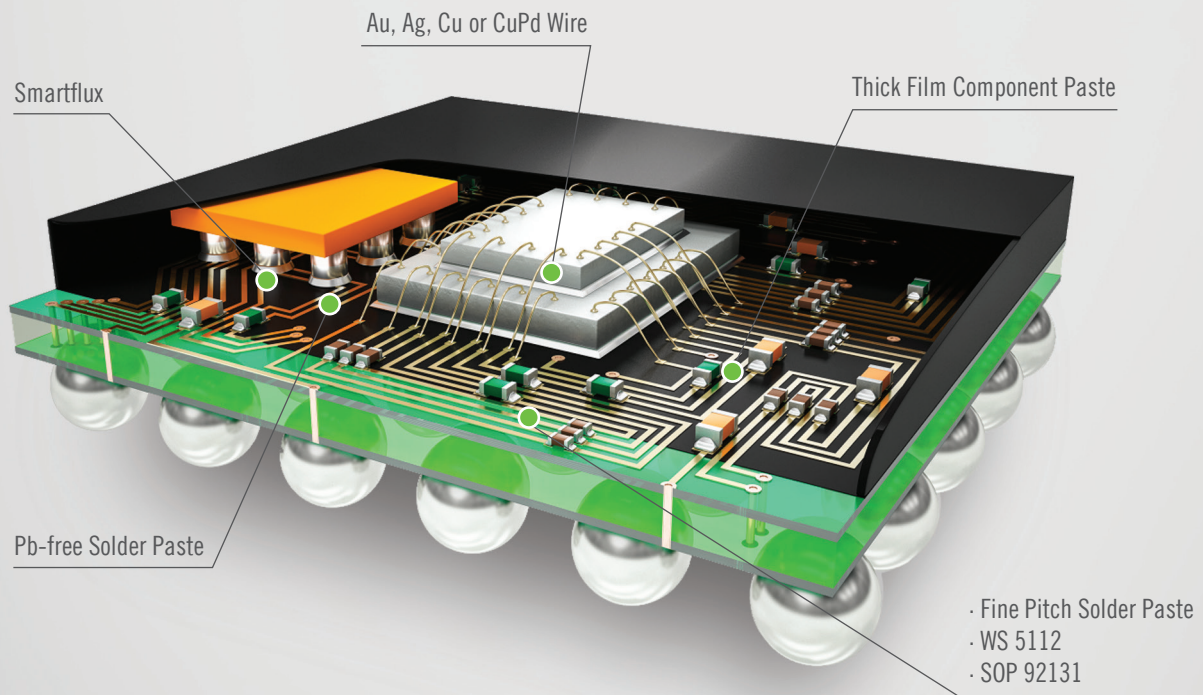
- ABS/ESC braking assistant
- Air bags & cameras
- Braking systems
- Locking systems
- Traction control

Materials Solutions for Body Electronics and Infotainment System

Connectivity makes mobility safer, more efficient, and more convenient. Car interior surfaces are increasingly trending towards touch interfaces and consoles, incorporating capacitive sensing and switching. Our materials solutions are making it possible to merge capacitive sensing with 3D shapes and forms, increasing reliability and decreasing failure modes associated with individual mechanical switches or buttons.

We offer broad-base solder materials for SMT components such as passive and LED components as well as for fine pitch SiP (System-in-Package) applications down to 60µm line space. Our materials help to reduce the form factor and weight of electronic modules.

HERAEUS MATCHED MATERIALS FOR ELECTRONICS ASSEMBLY





BODY ELECTRONICS APPLICATIONS

- Active suspension
- Cooling systems
- Heating, Ventilation and Air Conditioning (HVAC)
- Power windows & controls
- Power seats & controls
- Fuel gauge
- Interior ambient lighting



INFOTAINMENT APPLICATIONS

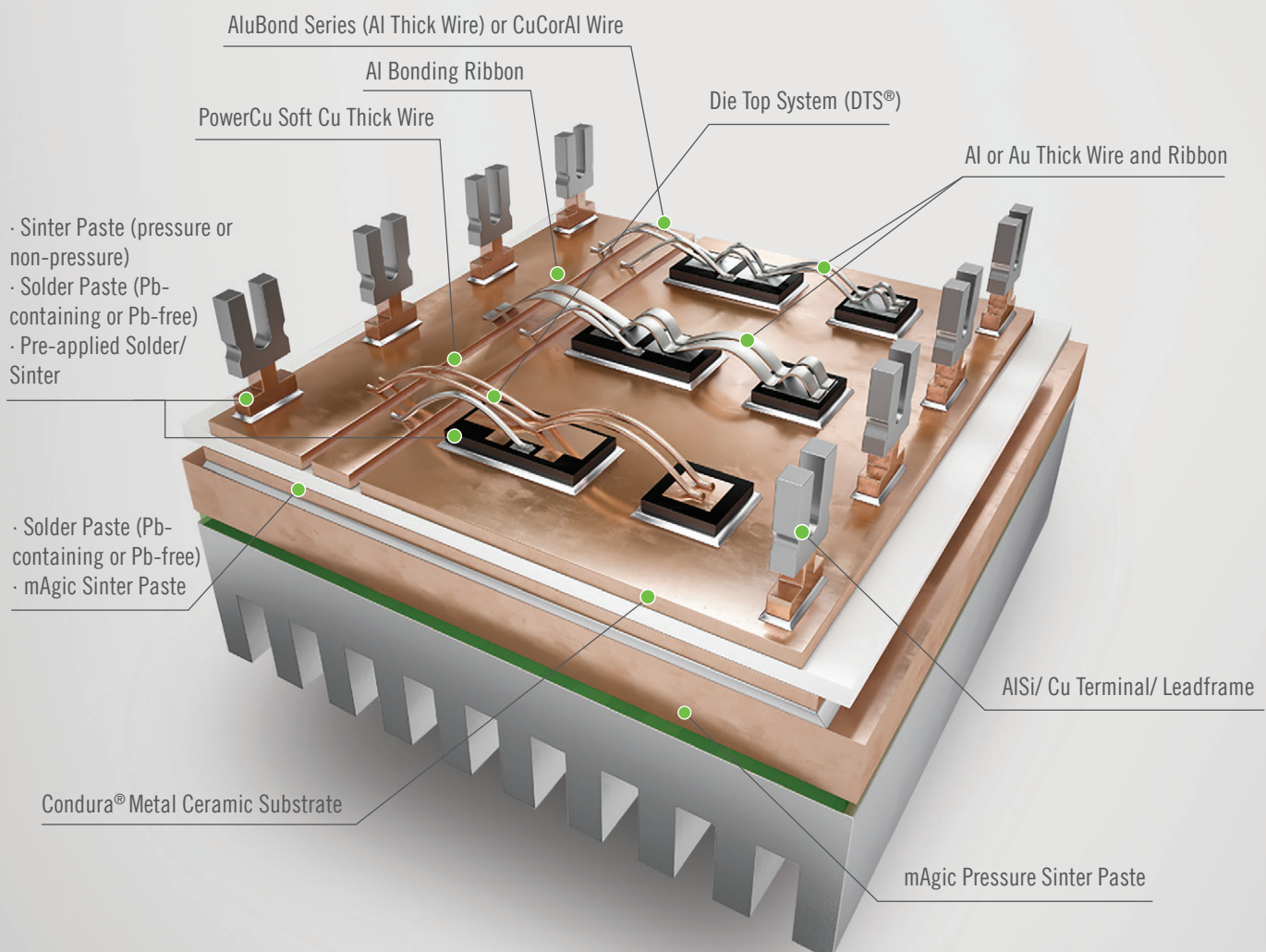
- Embedded navigation systems
- Bluetooth & WiFi
- Entertainment & sound systems
- Instrument cluster & head-up display
- Touch screen monitors



Materials Solutions for Powertrain and Electromobility

Powertrain and the electric drive systems have critical roles to play in tackling the world's energy and climate change challenges. Electromobility is gaining traction in the mass market and becoming more economically viable for manufacturers. Our materials solutions for power electronics, battery connection and heating, as well as for charging deliver superior performance and ensure the highest level of reliability.

HERAEUS MATCHED MATERIALS FOR POWER ELECTRONIC MODULES





POWERTRAIN APPLICATIONS

- Cruise control
- Engine control units
- Fuel injection
- Transmission control units
- Power electronics (modules, inverter)
- Engine



ELECTROMOBILITY APPLICATIONS

- Battery
- Control modules
- Power electronics (modules, inverter)
- On-board charging units
- Charging devices (also external)



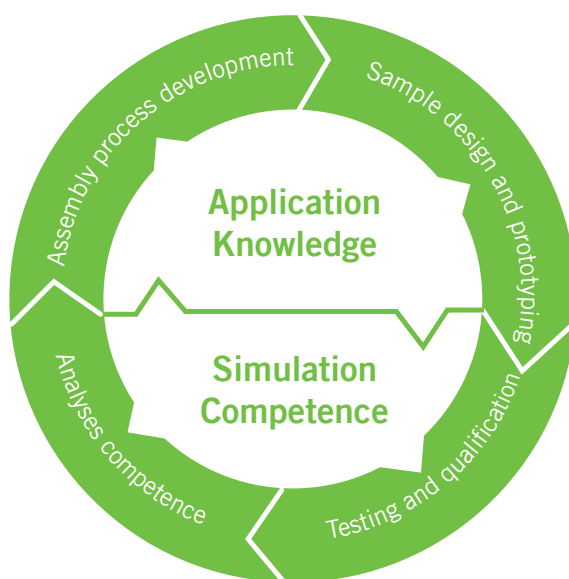
Let Our Services Become Your Strength

Our state-of-the-art application center in Hanau, Germany, offers a range of services to develop customer specific solutions. Over 25 developers enable fast development and an efficient use of resources in the value chain. The application center offers an optimal infrastructure for simulation, design, prototyping, testing and qualification of material systems in power electronic modules on 730 m², thereof 110 m² ISO8 clean room. This allows manufacturers to better understand material behaviors, combinations, and the reliability of their products under real application conditions.

Our regional service labs in West Conshohocken (USA), Shanghai and Changshu (China) and Singapore are specialized in the needs of the local markets and guarantee a close proximity and quick response time for our customers.

By using our comprehensive state-of-the-art equipment and tools, our customers benefit from faster development with higher first-time success rates. Our service portfolio together with our experience in packaging solutions contribute to solve our customers' challenges.

The Heraeus Engineering Services Model





SIMULATION

Thermal simulation
Thermo-mechanical stress simulation
Lifetime prediction

MATERIAL ANALYSIS

Fatigue analysis
Root cause analysis

PROTOTYPE DESIGN

Electrical design
Mechanical design

PROCESS OPTIMIZATION

Parameter definition
Yield optimization

HERAEUS ENGINEERING SERVICES

PROTOTYPE ASSEMBLY

Power modules
LED modules
Documentation, traceability

TESTING & QUALIFICATION

Environmental tests
Thermal cycling tests
Active cycling tests



Production Sites and Application Centers

Close to Our Customers Around the World



PRODUCTION SITES

Hanau
Timisoara
West Conshohocken
Johor Bahru
Changshu
Zhaoyuan
Singapore (2x)

APPLICATION CENTERS

Hanau
West Conshohocken
Shanghai
Hsinchu
Singapore

We are Heraeus Electronics

We are one of the leading manufacturers of materials for the assembly and packaging of devices in the electronics industry.

We develop sophisticated materials solutions for consumer electronics and computing, automotive, LED, power electronics and communications.

Our core competencies include bonding wires, assembly materials, thick film pastes as well as roll clad strips and substrates, and their integration into perfectly matched systems.



Headquartered in
Hanau, Germany



More than **50 years**
of experience in providing
materials for electronics industry



Over **1200**
employees worldwide



Product distribution to
over **50 countries**



8 production sites
across **6 countries**

Heraeus Group

The Global Technology Company

Heraeus, the technology group headquartered in Hanau, Germany, is a leading international family-owned portfolio company. The company's roots go back to a family pharmacy started in 1660. Today, the Heraeus group includes businesses in the environmental, electronics, health and industrial applications sectors. Customers benefit from innovative technologies and solutions based on broad materials expertise and technological leadership.

In the 2020 financial year, the FORTUNE Global 500 listed group generated revenues of €31.5 billion with approximately 14,800 employees in 40 countries. Heraeus is one of the top 10 family-owned companies in Germany and holds a leading position in its global markets.

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