



MekTEC[®]
Flexible Printed Circuits

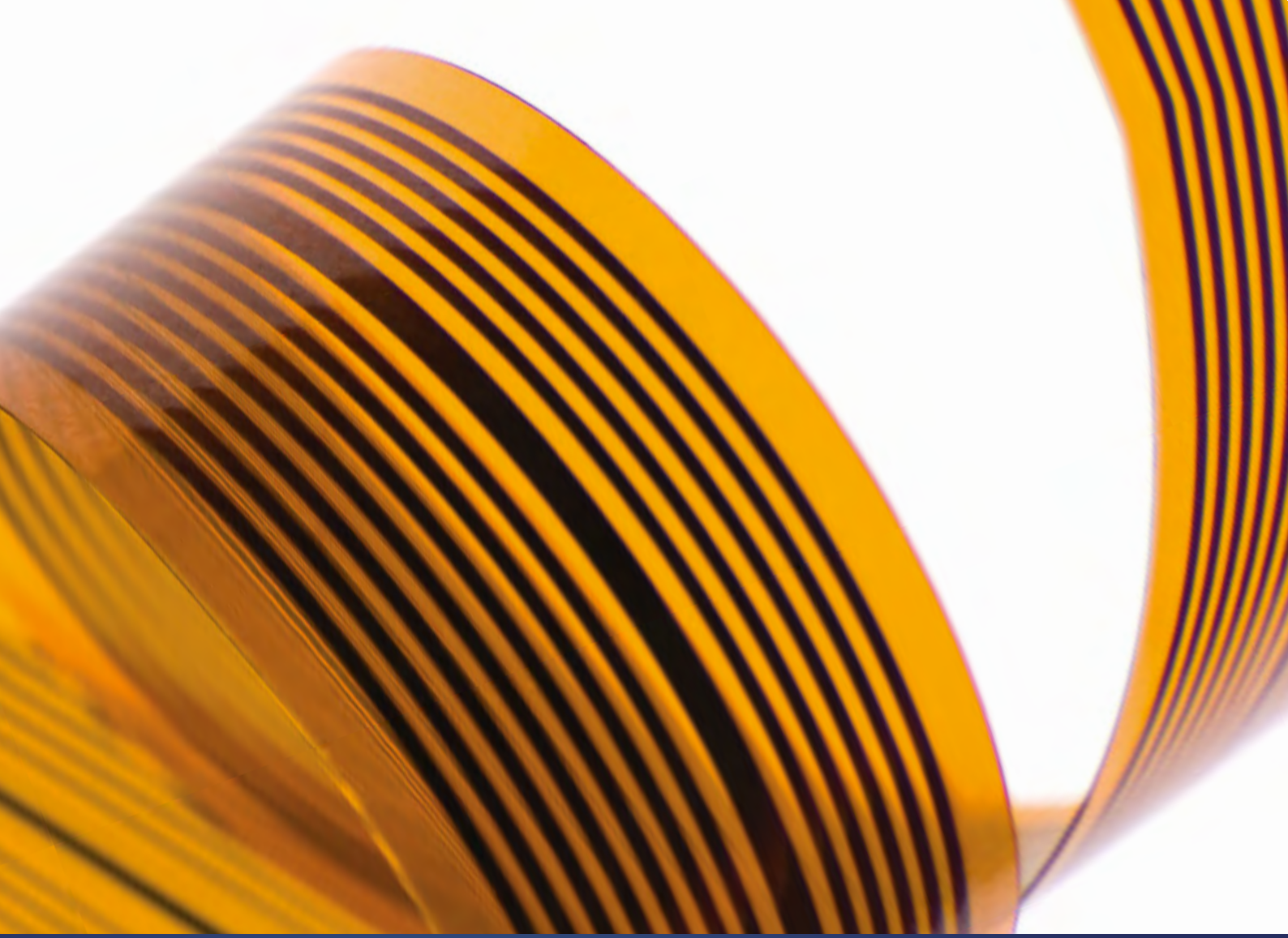


AUTOMOTIVE INNOVATION



MEKTEC: THE FLEX SPECIALIST

For over 30 years, the Mektec group has provided the most advanced technology and highest level of integration in the automotive industry. More than 30,000 employees worldwide produce flexible printed-circuit boards (flex/FPC) for connecting electronics and mechanics. The main area of application is cars, including gears, sensors, switches, infotainment and lighting systems. To offer the best service to its customers, Mektec has 15 manufacturing facilities in Asia and Europe as well as 18 sales companies worldwide.

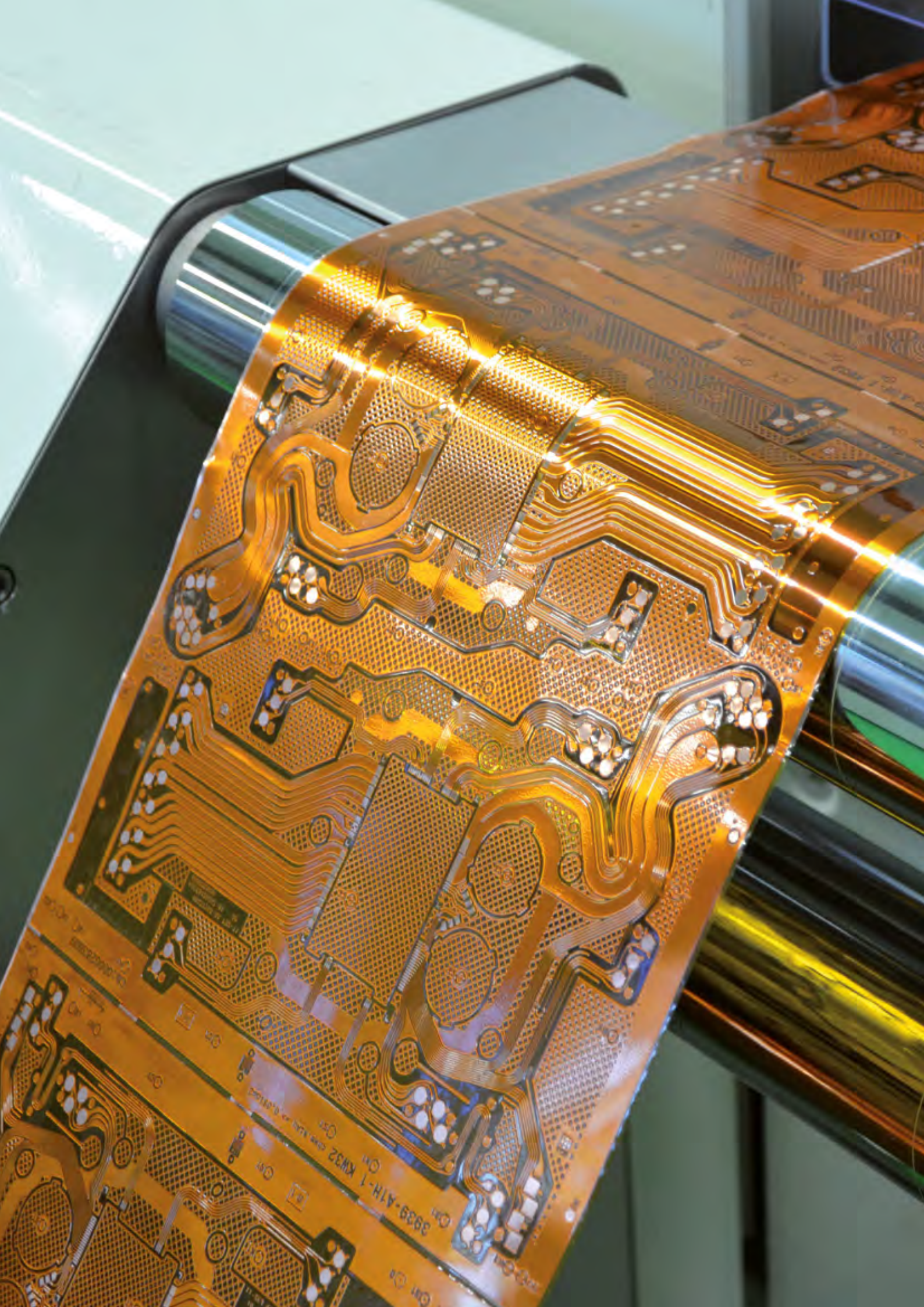


QUALITY AND COST EFFICIENCY FROM THE MARKET LEADER

As a high-tech company, Mektec covers the entire value chain, from the production of materials to complex modules. With this strategy, Mektec has established itself as the market leader, not only in terms of sales figures, but also in terms of quality, cost and technology. Besides the automotive sector, this 3.2 billion dollar strong company offers flexible circuits for the electronics and medical industries as well as the telecommunications market.

FROM ULTRA-FINE LINE CIRCUITS TO MULTILAYER CIRCUITS

Mektec works with customers on creating the features of the future, be they the latest LED lighting concepts or hybrid powertrains. The company offers all the necessary technologies, from single, double-sided and multilayered circuits to ultra-fine line circuits.



3939-A1H-1 KM32 see list of prices
GM

GM



FLEX: MINIMUM SPACE FOR MAXIMUM TECH

Automotive industry demands are exacting – flexible circuits must withstand wide temperature fluctuations, severe vibration and oscillations while remaining highly reliable, all at the lowest possible cost. Flex circuits by Mektec offer the following advantages:

- **Maximum Flexibility:**
Folds and adapts to small spaces, including 3D installations.
- **Maximum Resiliency:**
More than 100 million bending cycles without loss of signal.
- **Maximum Reliability:**
For more than five years the error and response rate has been zero ppm (with more than 10 million parts in large-scale production).
- **Maximum Reduction of Mechanical Stress:**
Due to their structure, flex circuits balance tolerances and compensate for oscillations and vibrations.
- **Maximum Resistance to Chemical Agents:**
Even under severe temperature fluctuations and high continuous temperatures.

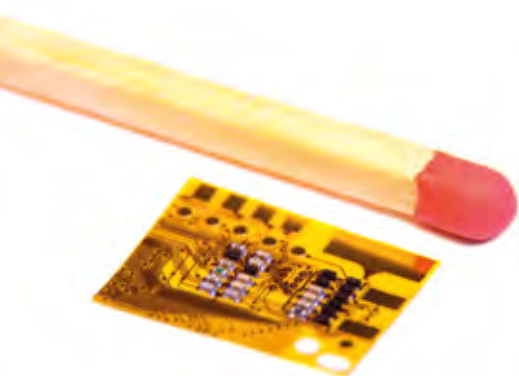
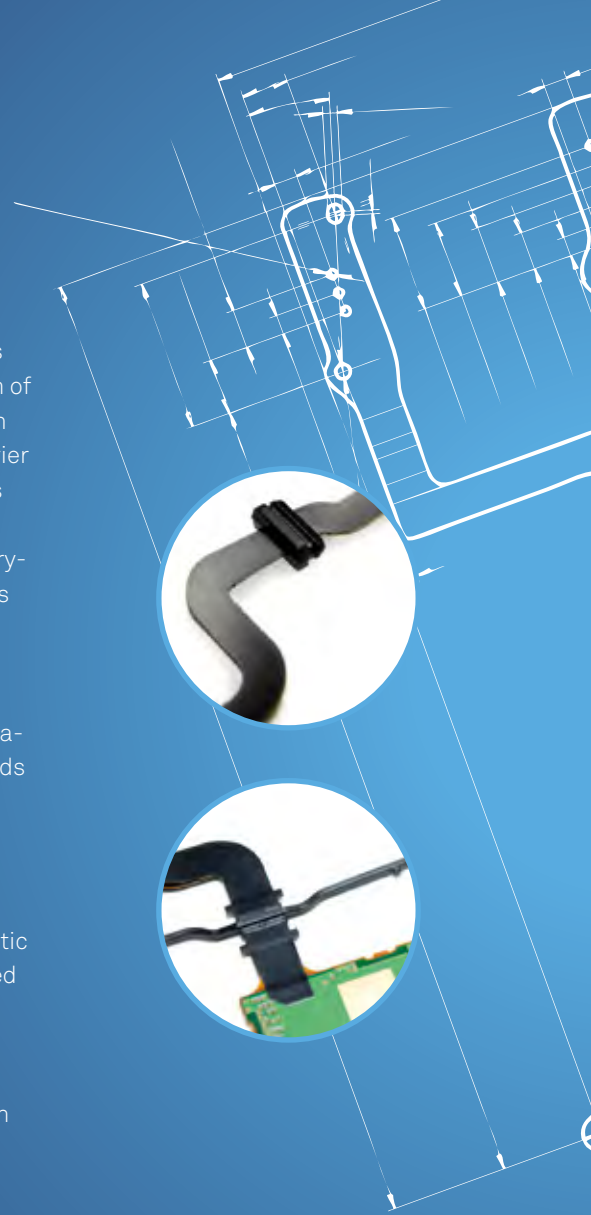


FPC MODULES FROM A SINGLE SOURCE: MINIMAL RISK, MAXIMUM BENEFITS

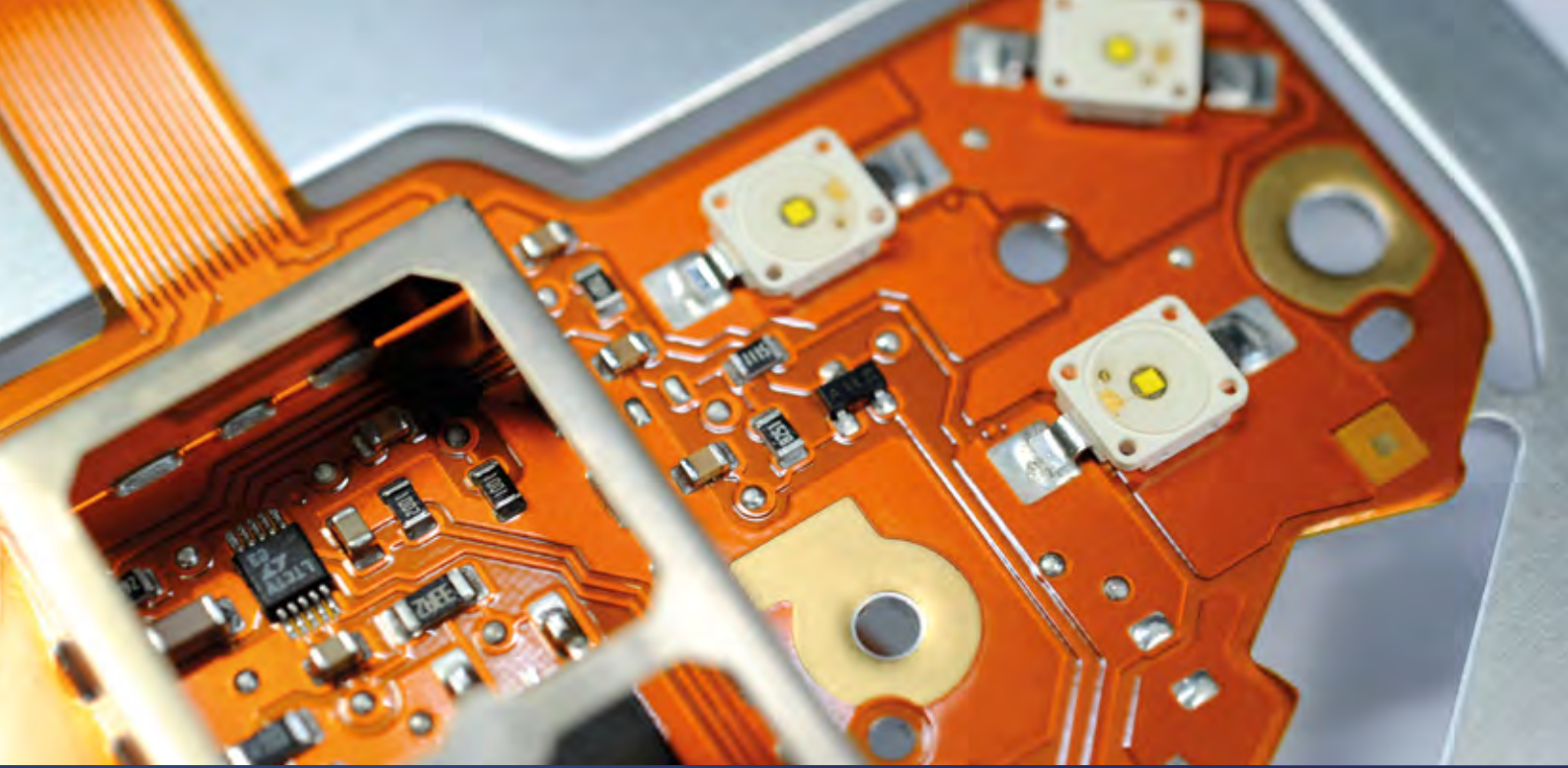
FPC modules are the basis of many new developments, including seals, plastic elements and integrated electronic components. Any form of connection and mounting technique with and on flexible circuit boards is possible, from chip carrier for CSP (Chip Scale Package) to LCD driver chips in CoF (Chip on Flex) to flexible μ -substrates for MCM (Multi Chip-Module). Mektec provides everything from a single source, minimizing interfaces to components of other manufacturers and the resultant risks such as connection errors.

To meet the demand for higher functional integration, Mektec has introduced flexible circuit boards with sealing functions. This patented solution enables the sealing of electrical connections. The technology was first used in diesel injection pumps, and is used today in high-volume production of mobile phones. The precision plastic parts and seals are developed and manufactured by Mektec Precision Components in Asia.

A new combination of lead frames with flex and plastic parts allows for the parallel transmission of signal and power currents, and is used for hybrid powertrains.

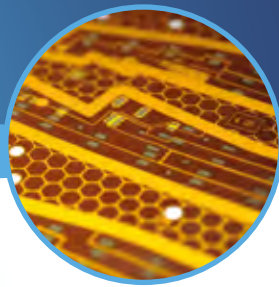






LIGHTING

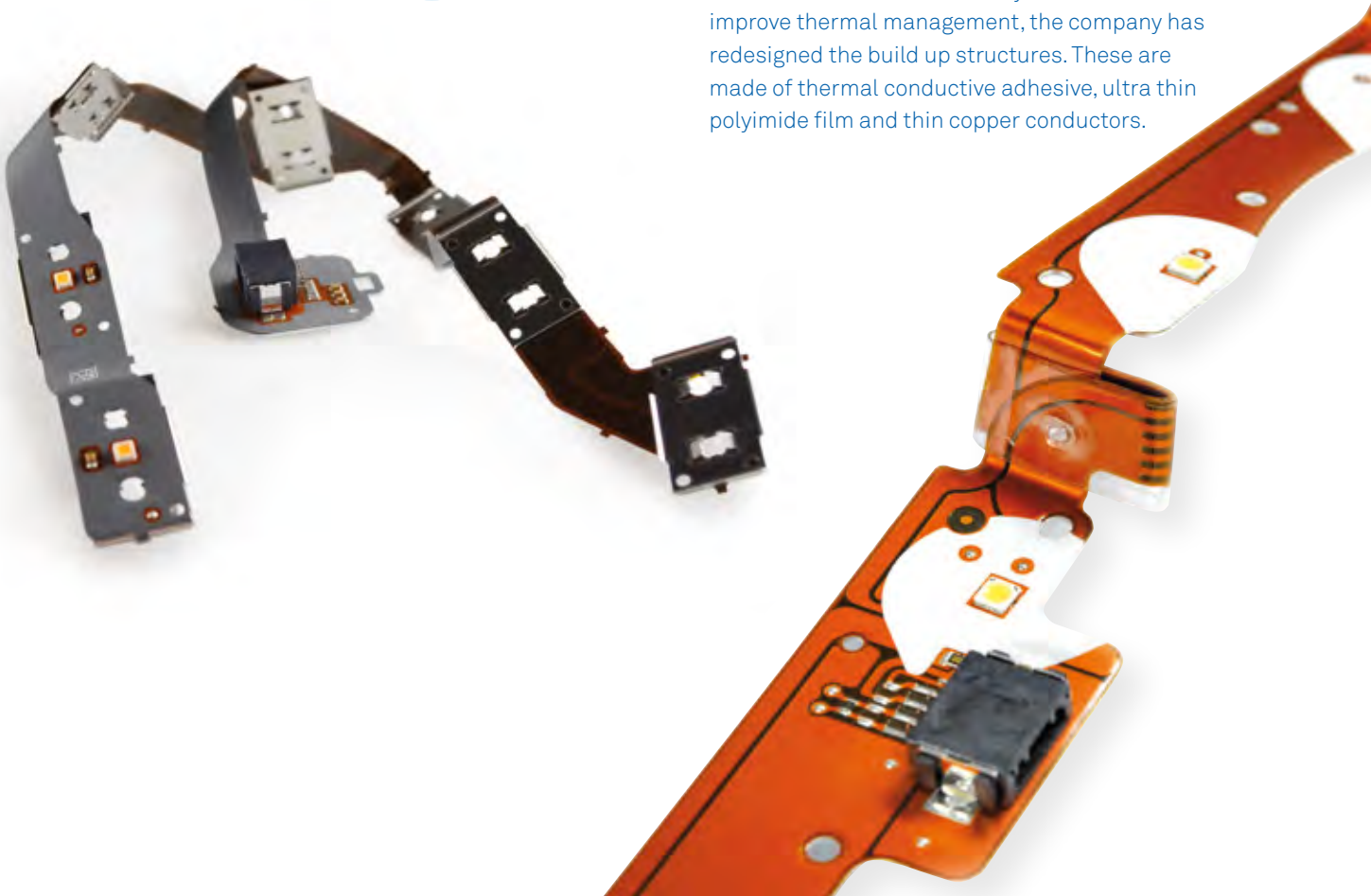
The latest LED headlights, daytime running lights, interior lights, rear turn signals and blinkers not only give vehicles a unique look, but also provide greater safety. Only through the use of flex circuits are these LED applications feasible. No longer does design follow lighting restrictions. Instead, flex creates the ultimate design freedom in spatial arrangement and simplifies three-dimensional assembly. Even heat dissipation is improved, since metal stiffeners on the flex circuit act as heat sinks or traps. They also serve as a supporting element for light guides.

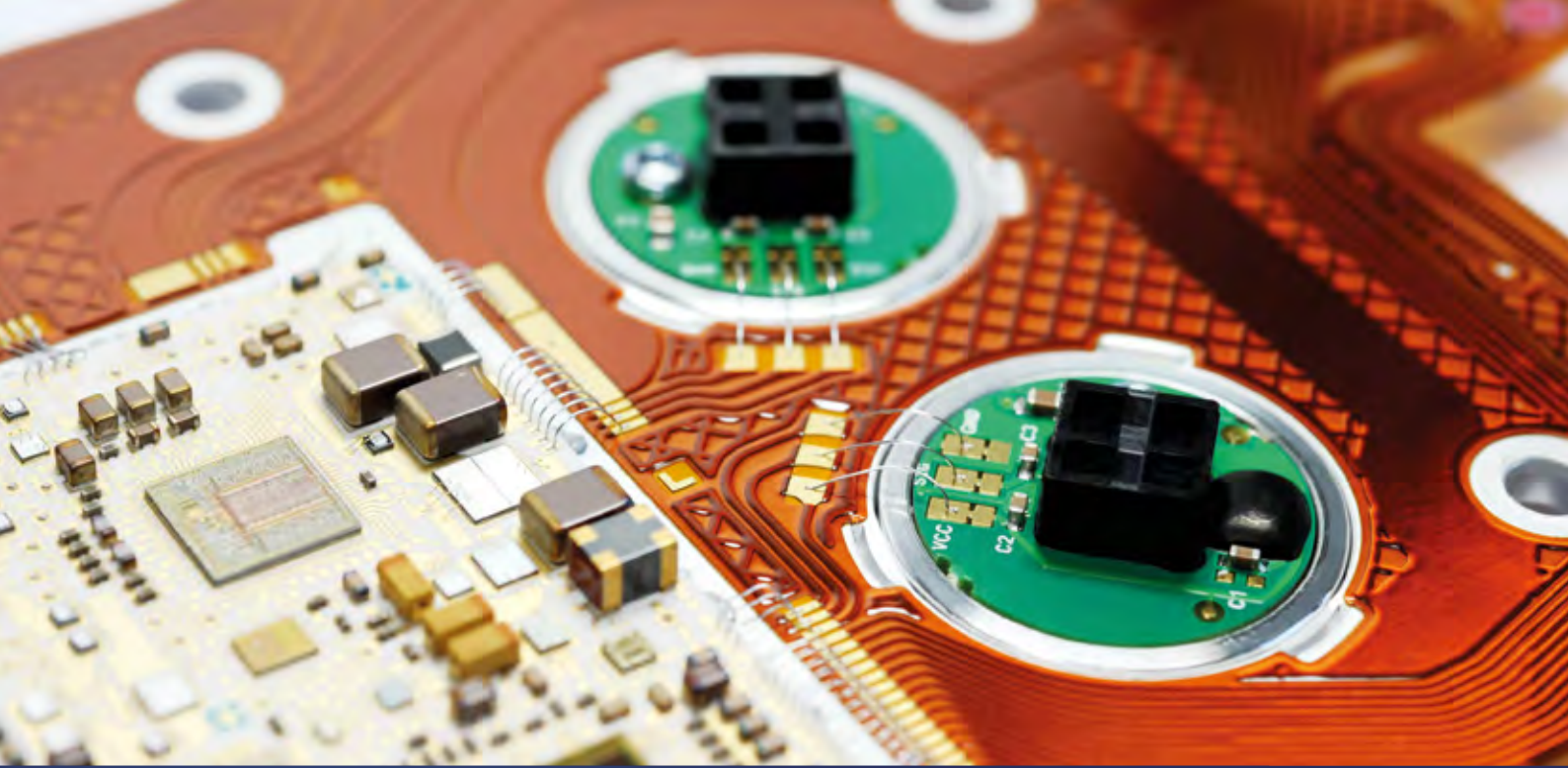




+ MEKTEC:
TAKING IT TO THE NEXT LEVEL

As a high-tech specialist company, Mektec is not satisfied with what already exists. To further improve thermal management, the company has redesigned the build up structures. These are made of thermal conductive adhesive, ultra thin polyimide film and thin copper conductors.





POWERTRAIN

Drive components must be designed for efficiency from the ground up, to maximize performance and dynamics while minimizing fuel consumption. Without flex circuits, many modern controls in automatic and dual-clutch transmissions, batteries and starter generators in hybrid and electric vehicles would be unthinkable. The Mekttec technology center in Weinheim, working with automotive industry customers, has developed the right solutions for connecting control electronics with connectors, sensors and actuators.

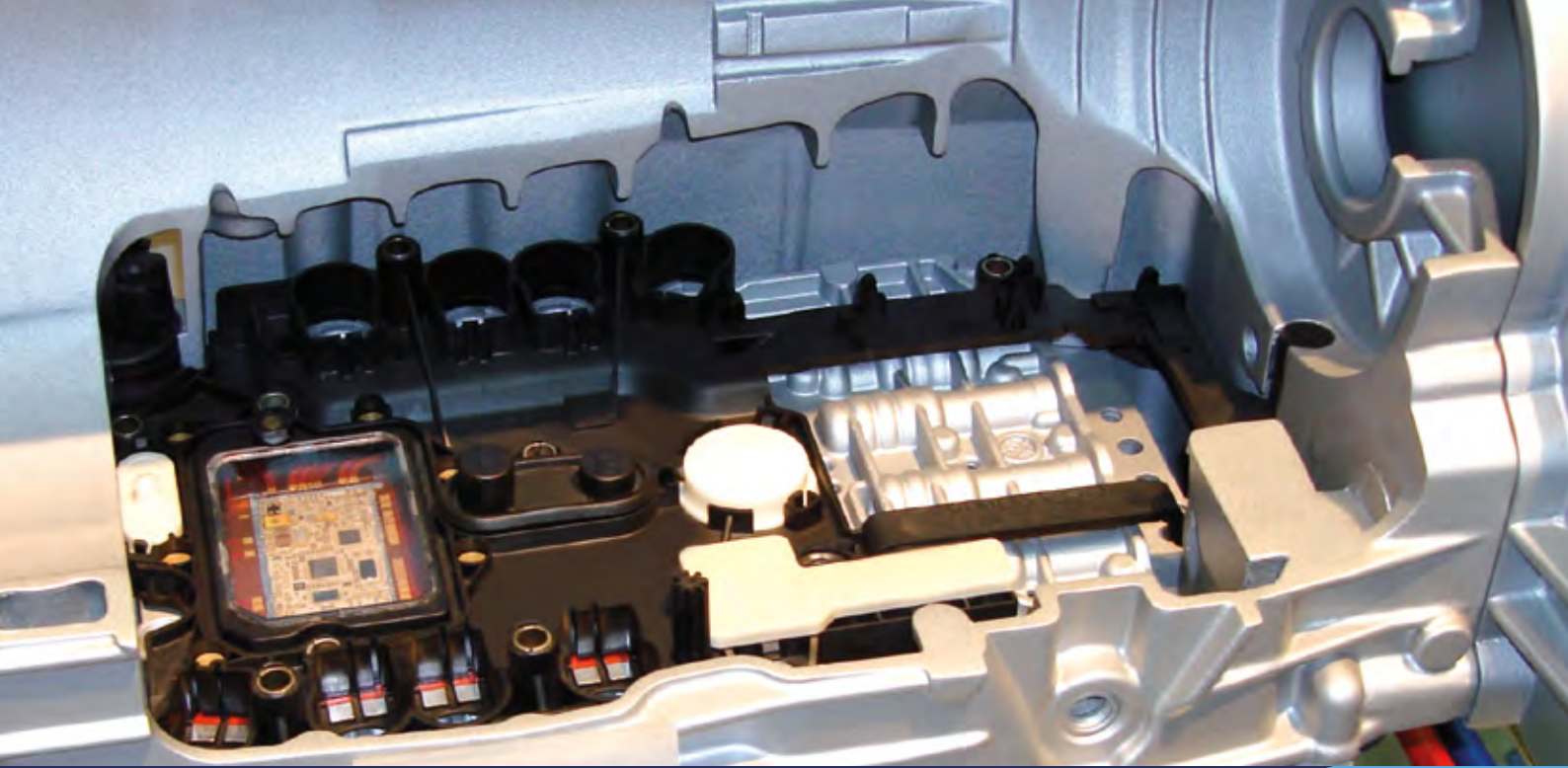


Hybrid



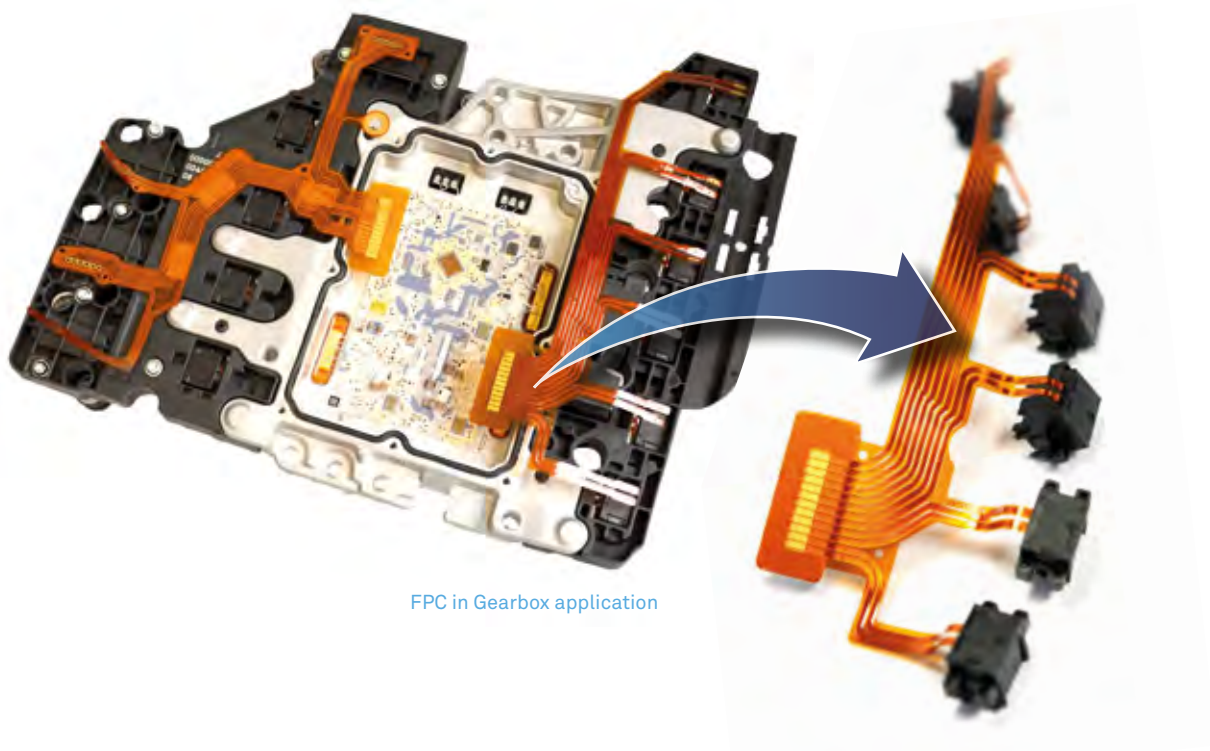
Gearbox





+ MEKTEC:
TAKING IT TO THE NEXT LEVEL

Flex circuits by Mektec can be used even in extreme conditions. Aggressive transmission fluids, temperature changes from -40 to +140 degrees or temperatures of 150 degrees Celsius for 1000 operating hours are not a problem.



FPC in Gearbox application

CAR INFOTAINMENT

Whether for information or entertainment, music, radio, navigation, mobile device connectivity or head-up display, the number of visual displays in cars is constantly increasing. Modern display connections (HD resolution) require ultra-fine line circuits, with LEDs applied for backlighting.

+ MEKTEC:
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Optical conductor and sensor films provide additional functional integration and increased reliability, by further reducing interfaces.

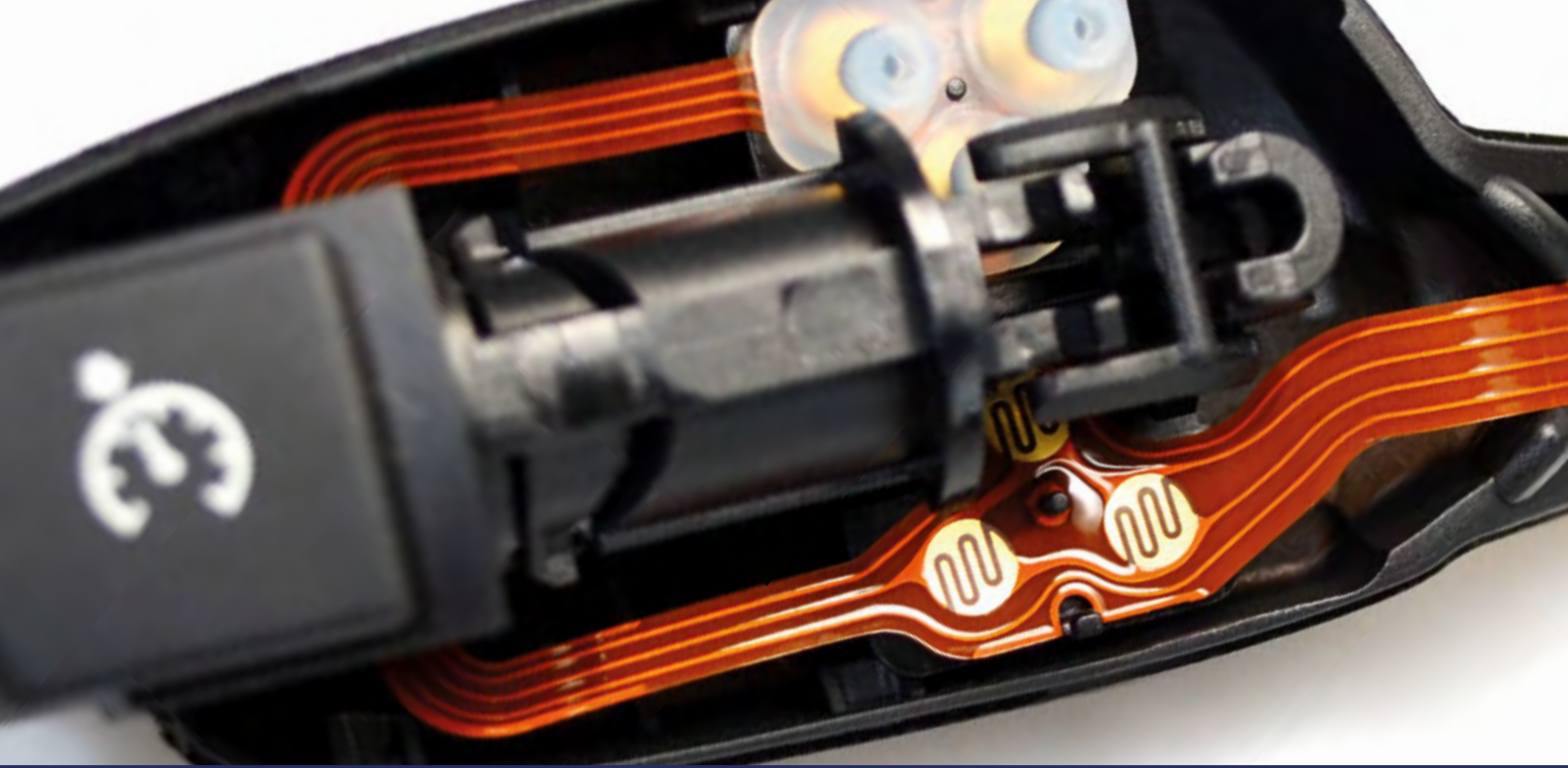


FPC for Display



FPC for Car Speaker





SWITCHES AND SENSORS

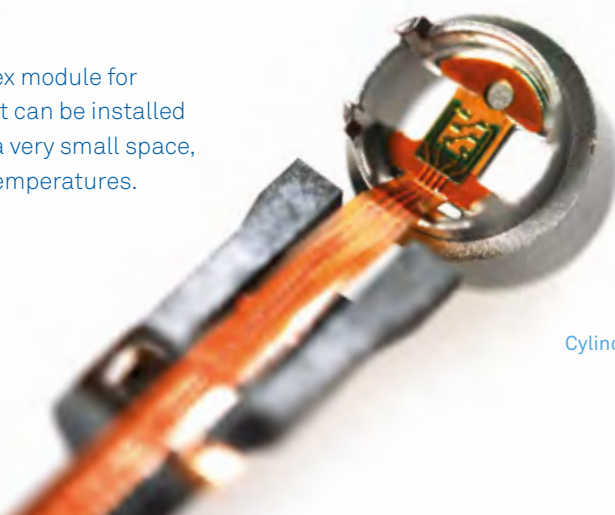
Undetected by the naked eye, many switches and sensors work using flex technology. These include temperature sensors for air conditioning, pressure sensors in brakes and transmissions, keyless entry systems with piezo sensors, camera-based sensors for the control of adaptive optical systems, traffic signs and lane detection, and night vision. Steering wheels, gear shifts and iDrive

navigation systems are also operated by means of flexible circuit boards, and require a high level of integration in compact spaces. Consequently, accurate and diverse switching functions in one application are essential.

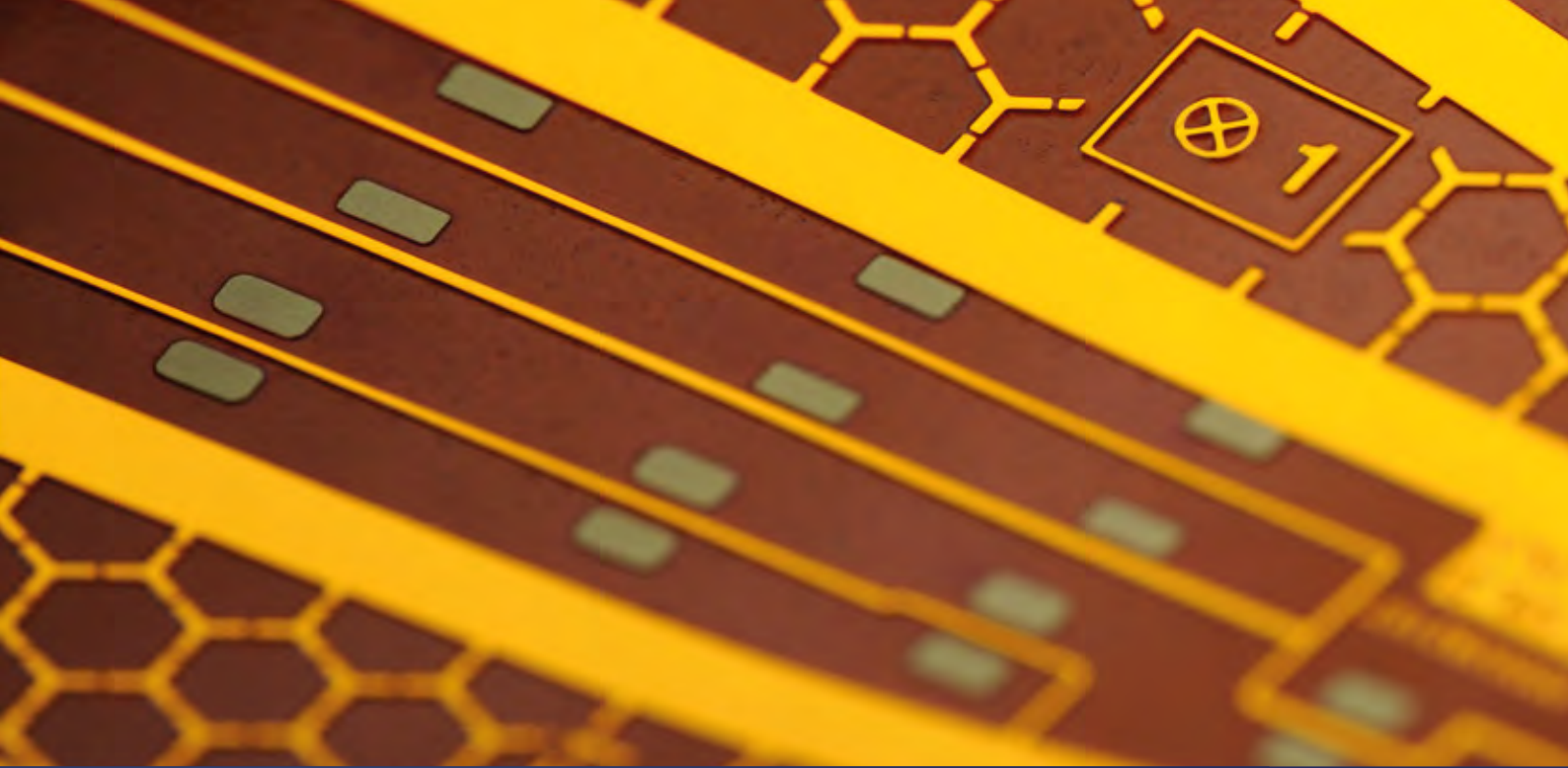


+ MEKTEC: TAKING IT TO THE NEXT LEVEL

The latest development is a flex module for measuring cylinder pressure. It can be installed directly in the cylinder within a very small space, and can withstand very high temperatures.



Cylinder Pressure Sensor



SERVICES

The Mektec Group specializes in the manufacture of flexible printed-circuit boards, including assembly and precision plastic parts. It assists customers in the development of the latest features and applications. Technologically ahead of the state of the art, the company provides solutions for cost optimization in design and production.





EXAMPLES FOR THE MULTIPLE
USAGE OF OUR
FLEXIBLE PRINTED CIRCUITS

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