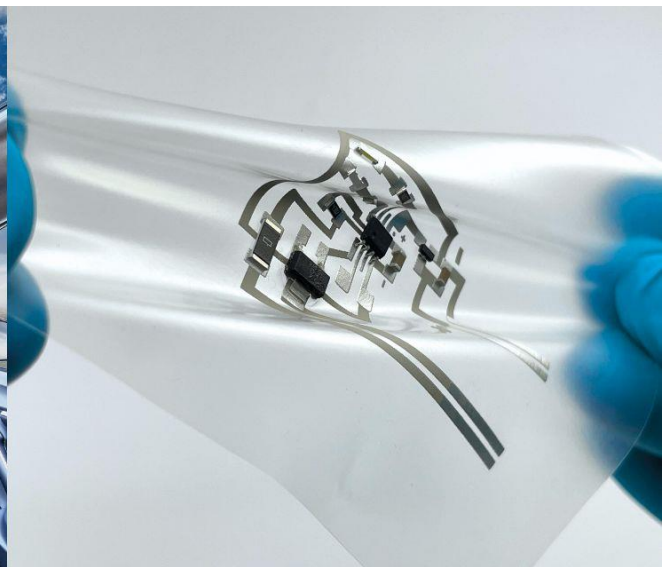




Automotive industry is a major driver of printed electronics growth. Application areas cover an extensive range either in powertrain (e.g., battery management and thermal interfaces) or interior design (e.g., HMI technologies, interior warmers, displays, 3D smart interfaces with integrated light and decorative elements) and even car exteriors (e.g., integrated antennas, photovoltaics, lights and displays).



Experts suggest that a significant focus on differentiation within the automotive industry is now directed toward developments occurring in interior design and features. Motivations such as cost efficiency, size and weight reduction, lower energy requirements, design freedom and enhanced aesthetics fuel the progress of printed electronics.

HMI and interior sensing solutions

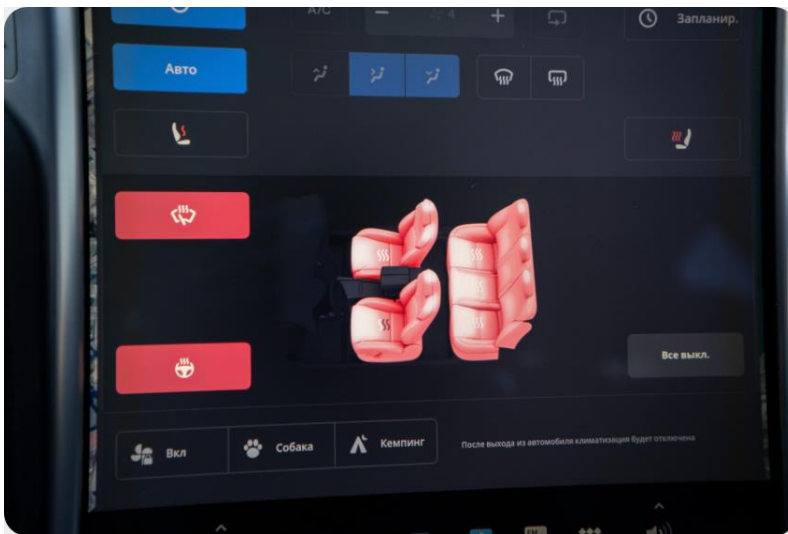
A primary market for printed and hybrid electronics in automotive industry is the development of Human-Machine Interfaces (HMI) with seamless design. Stretchable electronics and sensor solutions are integrated in plastic, textile or leather parts turning them into smart surfaces that enhance user experiences. Lightweight, flexible and stretchable HMI solutions with customizable form factors replace mechanical buttons and complex wiring systems.



Flexible printed sensors allow for the development of beautifully functional HMI systems with any desired sensing layouts that serve to control and adjust motions, climate, volume, lighting and similar functions at users' fingertips. The combination of functionality and aesthetics is attained through the integration of touch-sensitive technology with lighting and other decorative elements.

Saral Inks® portfolio for these applications ranges from stretchable conductive inks, printed sensor inks and conductive adhesive inks for LED and SMD attachment and interconnection of several printed electronics layers together; all easily screen-printable.

Embedded sensing solutions within steering wheels, seats and seatbelts are few examples of established practices aimed at enhancing safety and comfort in automotive interiors. Advanced flexible printed pressure and capacitive sensitive electronics facilitate the detection and classification of vehicle occupants.



Heating and thermal management

Printed temperature sensing and heating elements for interior comfort, EV motor drives or battery thermal management constitute other trending application areas of printed electronics in the automotive context.

Printed battery safety sensors ensure the early detection of critical situations in the battery packs in a non-complex and very efficient way. These flexible and thin printed electronics on polymer

foils with heating or sensing function facilitate easy handling and integration among individual cells within the battery module. They secure equal distribution of charge, prevent over-charging and improve battery lifetime.

Saral Inks® solutions for comprehensive thermal management include functional inks for printed sensing and heating elements, suitable for battery monitoring, seat and floor warming, as well as defroster systems.

Smart surfaces with 3D geometries

Film insert molding and In-Mold Electronics (IME) stand as pioneering technologies for the integration of printed electronics into automotive parts; with IME emerging as the promising solution for making 3D smart surfaces where conductive inks play the central role.

At the core of IME lies the thermoforming process of printed electronics that involves high pressure and temperatures.

Saral StretchSilver 800 conductive ink exhibits remarkable resilience when printed on Polycarbonate (PC) sheets and going through 3D thermoforming processes without sacrificing functionality.



Source: Saralon