

The Global Market for Printable, Flexible and Stretchable Electronics to 2030

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Abstracts

Potential applications for the printed, flexible and stretchable electronics industry appear endless. The rapid boom in smart wearable and integrated electronic devices has stimulated demand for advanced intelligent systems with high performance, micro size, mechanical flexibility, and high-temperature stability. These systems must also be able to conform to the shape of and survive the environment in which they must operate. They are typically fabricated on flexible plastic substrates or are printed/woven into fabrics.

Based on a new generation of advanced materials, printed, flexible and stretchable sensors and electronics will enable new possibilities in a diverse range of industries from healthcare to automotive to buildings. These technologies will drive innovation in smart medical technology, automotive, smart manufacturing, Internet of Things (IoT) and consumer electronics.

The development of flexible or stretchable wearable electronic devices that maintain a high level of performance is a major electronics industry and research driver. Recent advances in stimuli-responsive surfaces and interfaces, sensors and actuators, flexible electronics, nanocoatings and conductive nanomaterials has led to the development of a new generation of smart and adaptive electronic fibers, yarns and fabrics for application in E-textiles. Wearable low-power silicon electronics, light-emitting diodes (LEDs) fabricated on fabrics, textiles with integrated Lithium-ion batteries (LIB) and electronic devices such as smart glasses, watches and lenses have been widely investigated and commercialized.

In the flexible displays market, Manufacturers such as Royole and Samsung are bringing flexible display products to the market in 2018. Other companies have developed

prototypes for smartphones, advertising and other wearables that they expect to bring to the market soon. The automotive industry is also heavily involved in research on flexible screens.

Wearable and mobile health monitoring technologies have recently received enormous interest worldwide due to the rapidly aging global populations and the drastically increasing demand for in-home healthcare. Commercially available and near commercial wearable devices facilitate the transmission of biomedical informatics and personal health recording. Body worn sensors, which can provide real-time continuous measurement of pertinent physiological parameters noninvasively and comfortably for extended periods of time, are of crucial importance for emerging applications of mobile medicine. Wearable sensors that can wirelessly provide pertinent health information while remaining unobtrusive, comfortable, low cost, and easy to operate and interpret, play an essential role.

Advancements over the last few years in electronics have led to the development of electronic (E-textiles) or smart textiles. Smart textiles and garments can sense environmental stimuli and react or adapt in a predetermined way. This involves either embedding or integrating sensors/actuators and electronic components into textiles for use in applications such as medical diagnostics and health monitoring, consumer electronics, safety instruments and automotive textiles.

Battery and electronics producers require thin, flexible energy storage and conversion devices to power their wearable technology. The growth in flexible electronics has resulted in increased demand for flexible, stretchable, bendable, rollable and foldable batteries and supercapacitors as power sources for application in flexible and wearable devices.

Many major companies have integrated conductive and electronic ink and materials in applications ranging from photovoltaics to smart packaging. There are over 100 companies with products in this space for RFID, smart clothing, sensors, antennas and transistors.

Report contents include:

Current and developmental printable, flexible and stretchable products.

Advanced materials used in printable, flexible and stretchable electronics and sensors.

Stage of commercialization for applications, from basic research to market entry. Markets covered include conductive inks, wearables and IoT, medical & healthcare sensors, electronic clothing & smart apparel, energy harvesting & storage, electronics components and flexible displays.

Market drivers and trends.

Market figures for printable, flexible and stretchable electronics, by markets, materials and applications to 2030.

Profiles of over 300 producers and product developers.

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