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The Global Market for Printed, Flexible and Stretchable Electronics to 2031

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Abstracts

The market for printed, flexible and stretchable electronics is growing fast. 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 for application as flexible and stretchable displays, personal health monitoring, human motion capturing, smart textiles, electronic skins and more. The key requirement for these applications is flexibility and stretchability, as these devices are subject to various mechanical deformations including twisting, bending, folding, and stretching during operation.

The development of printed, flexible and stretchable conductors over the last decade has resulted in commercialization of flexible and stretchable sensors, circuits, displays, and energy harvesters for next-generation wearables and soft robotics. These systems must 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.

The electronics industry is moving at a fast pace from standard, inflexible form factors to stretchable and conformable devices. Printed, flexible and stretchable electronics products are increasing weekly from wearables for healthcare to smart packaging, sensors, automotive tail lights and displays, flexible displays, photovoltaics and more.

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.

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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. Smart textiles and garments can sense environmental stimuli and react or adapt in a predetermined way. This involves either embedding or integrating sensors/actuators ad electronic components into textiles for use in applications such as medical diagnostics and health monitoring, consumer electronics, safety instruments and automotive textiles.

In the flexible displays market, electronics giants such as Samsung and LG Electronics have brought flexible, foldable and rollable smartphone, display and tablet products to the market.

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.

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. As well as advancing product security and consumer interaction, the use of smart inks and coatings in active and intelligent packaging can help reduce food waste

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and improve medical compliance-which would have significant environmental benefits.

Report contents include:

Current and developmental printable, flexible and stretchable products.

Advanced materials used in printable, flexible and stretchable electronics and sensors. Materials covered include conductive inks materials, carbon nanotubes, graphene, organic semiconductors, semiconducting perovskites, conductive polymers, metal mesh, silver ink, copper ink, various metal and metal oxide nanoparticles, 2D materials, nanofibers, nanocellulose, quanutm dots, graphene quantum dots, perovskite quantum dots and functional inorganic inks.

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

Market drivers and trends.

Product databases.

Market figures for printable, flexible and stretchable electronics, by markets, materials and applications to 2031.

Profiles of over 450 producers and product developers.

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