

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

<https://marketpublishers.com/r/G53F76B2CDFEN.html>

Date: March 2019

Pages: 600

Price: US\$ 2,000.00 (Single User License)

ID: G53F76B2CDFEN

Abstracts

Potential applications for the printed, flexible and stretchable and organic 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 & stretchable and organic sensors and electronics 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 printed, flexible & 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. This year we have also seen the commercial launch of foldable OLED smartphones from Samsung and Huawei.

In the flexible displays market, numerous consumer electronics are bringing flexible

display products to the market in 2019 in smartphones, advertising and other wearables. The automotive industry is also heavily involved in product development for flexible displays.

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.

There is huge global interest in incorporating electronic functions into clothing and wearable devices for applications such as wearable sensing, healthcare, soft robotics and human computer interfaces. These areas will greatly benefit from developing electrical interconnects, sensors, transistors and circuits, lighting elements and power sources that are fully stretchable and conformable.

Electronics and power sources electronics which are not only flexible but also conformable and deformable offer the advantages of conventional devices while ideally maintaining excellent electrical properties under strain. They can be stretched like a rubber band and twisted like a rope without any significant reduction in performance. Their development is key to the realization of wearables as they can deform along with soft interfaces such as:

textiles.

skin.

tissue.

moving components in devices and robots.

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 printed, flexible & stretchable and organic electronics products.

Advanced materials used in printable, flexible & stretchable and organic 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.

Profiles of over 350 producers and product developers.

Global market revenues and forecasts 2015-2030.

Market analysis:

conductive inks

wearables and IoT

medical & healthcare sensors

RFID and NFC Devices

flexible thin film transistors

Antennas and Microwave Devices

electronic clothing & smart apparel

energy harvesting & storage

electronics components and flexible displays

flexible photovoltaics

flexible sensors, actuators and transducers

OLED lighting.

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