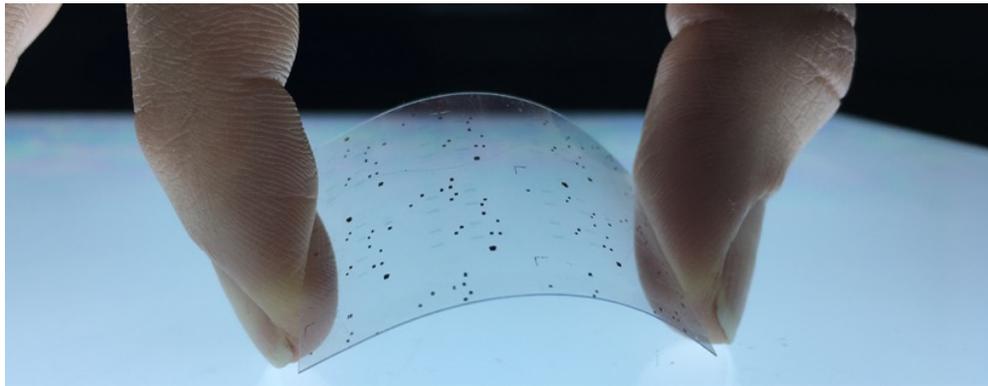


THE PROJECT

FLEEP will turn common packaging labels into active items at negligible additional costs through the manufacturing of flexible, lightweight, easy to integrate electronic labels. FLEEP technology will serve the packaging and electronics industries, and will have broad applications, from the food, to the pharma and cosmetics sector.

FLEEP was born as a spin-off project of the Istituto Italiano di Tecnologia (IIT) based on a proprietary technology for the realization of microelectronic integrated flexible circuits and focused on the use of organic polymer inks without the use of silicon.



A flexible and transparent plastic microchip made by FLEEP

The technology, known as printed electronics, allows to realize low cost and low environmental impact electronics with printing techniques derived from graphic arts (inkjet, flexography, etc..), changing the manufacturing vision of microchips from "number of chips per day" to "kilometers of chips per hour". The process has been validated at prototype level through several commercial projects, one of them commissioned by one of the three largest multinationals in electronic manufacturing.

The business model includes strategic partnerships with printing machinery manufacturers and electronics manufacturers. In a potential market of about \$10B, FLEEP will benefit from the sale of process licenses to manufacturers, from share-revenues resulting from partnerships and from the direct sale of smart-labels.

THE TECHNOLOGY

The core FLEEP's know-how is the fabrication of fully-printed integrated circuits of low/medium complexity on plastic substrates that can be as thin as one tenth of a human hair.

The process starts with the dissolution of functionalized plastics to obtain special inks that can then be printed on almost any substrate with standard graphic-arts inherited machineries. The use of printing machinery (flexographic, offset, gravure, ink-jet, bar-coating, slot-die coating) for the fabrication of the smart-labels results in a process that is fully compatible with the standard equipment in use for the realization of common graphic labels.

The process employs only carbon-based materials (plastics) that can be recycled as common plastic goods. The results are electronic devices that are bendable, transparent, lightweight and paper-thin.

SOCIAL IMPACT

In the United States alone, the amount of non-recyclable electronic waste produced is about 50 million tonnes per year and the rapid and continuous expansion of technology will only increase this amount. This waste mainly contains non-disposable elements, earth-rare materials and precious metals. In a ubiquitous vision of electronics, how the Internet of Things industry wants to build, it is important to develop electronic devices that are environmentally sustainable through the entire lifecycle, from manufacturing to disposal.

FLEEP has a reduced environmental impact that leverages on three key points: 1) employs only suitably modified organic polymers (plastics) that can be recycled in the common plastic recycling cycles; 2) additive manufacturing processes avoid waste of materials; 3) minimization of the energy requirements for the fabrication of devices.

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