

# PARTNERS



# DETAILS

**PROJECT TITLE:** Soft Intelligence Epidermal Communication Platform  
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## MORE INFO:

[www.sintec-project.eu](http://www.sintec-project.eu)



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# SINTEC

SOFT INTELLIGENCE EPIDERMAL COMMUNICATION PLATFORM



# THE PROJECT

SINTEC is a [Horizon 2020](#) funded project that will provide [soft, sticky and stretchable sensor patches](#) that can be used multiple times and at longer periods. With its dynamic compliance and water repellent permeable encapsulation it withstands vigorous action, sweating and water; making it [ideal for an active life](#).

Our vision of extensible smart patches is a [non-invasive support system](#) that can be used all the time, allowing an active elderly person to be warned when their [health is slowly deteriorating](#) (for example in case of heart or muscle problems) or to help a person [recovering in a faster rehabilitation](#) with sensory support and recommendations from an app without having to be in a physiotherapy institute for too long (eg. after a long illness, stroke or trauma).

The main advantages should be in [comfort](#) and that the sensors do not move so much relative to the skin. Hence, its major impact will not be in replacing other wearables but rather [providing novel capability](#).

To demonstrate the advantages of the novel technology, SINTEC will apply it in [clinical environment and in athletics performance evaluation](#).



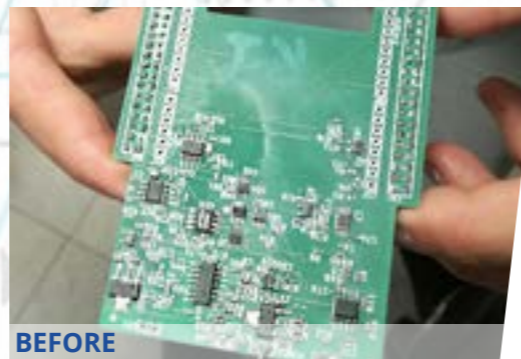
# THE TECHNOLOGY

The aim of SINTEC is to [advance a rigid-stretch PCB technology with stretchable substrate and liquid alloy](#), and to demonstrate its usability in complex applications, involving wearable sensing, embedded processing, and Fat-IBC. This will substantiate the advantages with this rigid-stretch technology and its improvement area. Industrial manufacturability and cost/scaling issues will be investigated.

Its unique features will enable a ground breaking [intra body communication](#) technique that provides secure communication at large bandwidth and low power, allowing for multiplex sensoric inputs from many sensor nodes on the body.

## SINTEC MAIN OBJECTIVES ARE:

- To demonstrate manufacturing of large area rigid-stretch PCB technology stretchable substrate and liquid alloy interconnects;
- To demonstrate and compare the advantages of compliant and stretchable multi-use smart patches for Fat-IBC and low-energy Bluetooth communication;
- To demonstrate the advantages of compliant and stretchable multi-use smart patches for electrophysiological sensing;
- To validate the large area rigid-stretch PCB integration technology in laboratory.



BEFORE



AFTER

# EXPECTED RESULTS

## 1. Manufacturing large-area rigid-stretch PCB



To make a ground-breaking novel large-area rigid-stretch PCB technology available for manufacturing on an industrial scale



To present long stretchable wireless sensor patches that survives multiple-use, and excessive dynamic stretching without contact failure



To make an assembly protocol that allows for recycling of batteries and reuse of more expensive components

## 2. Integrating Fat-IBC with electrophysiological sensors

We propose the communication through the fat tissue, which offers [lower losses for microwave propagation](#) compared to other tissues. We have previously demonstrated the feasibility of using fat tissue as a low loss microwave transmission channel for IBC and we have demonstrated successful communication scenario, where real data has been transferred through Fat-IBC.

## 3. Device demonstration in sports and healthcare

The novel SINTEC technology will greatly increase the usability of measuring methods, especially for reasons such as:

- being [less disturbing for athletes](#) compared to existing technology;
- enable [better compliance and adhesion to the human body](#) and can handle an intense elite elite sports, an activity that results in large amounts of sweating;
- enable [use in cold winter outdoor environment](#) (-15 °C);
- from the user perspective, the newly developed technology will be equipped with an intuitive and [easy-to-use user interface](#).