

An abstract graphic in the top-left corner consisting of several overlapping, flowing, purple lines that resemble a stylized flame or a complex, organic structure. The lines are darker in the center and fade to a lighter purple towards the edges.

# NOVEL PCB TECHNOLOGY ALLOWING ALTERNATIVE CARRIER MATERIALS

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



# CONVENTIONAL PCB FABRICATION

- Start from final carrier (e.g. FR4 epoxy) + Cu and perform
  - Cu patterning and wet etching
  - Lamination
  - Component assembly by soldering

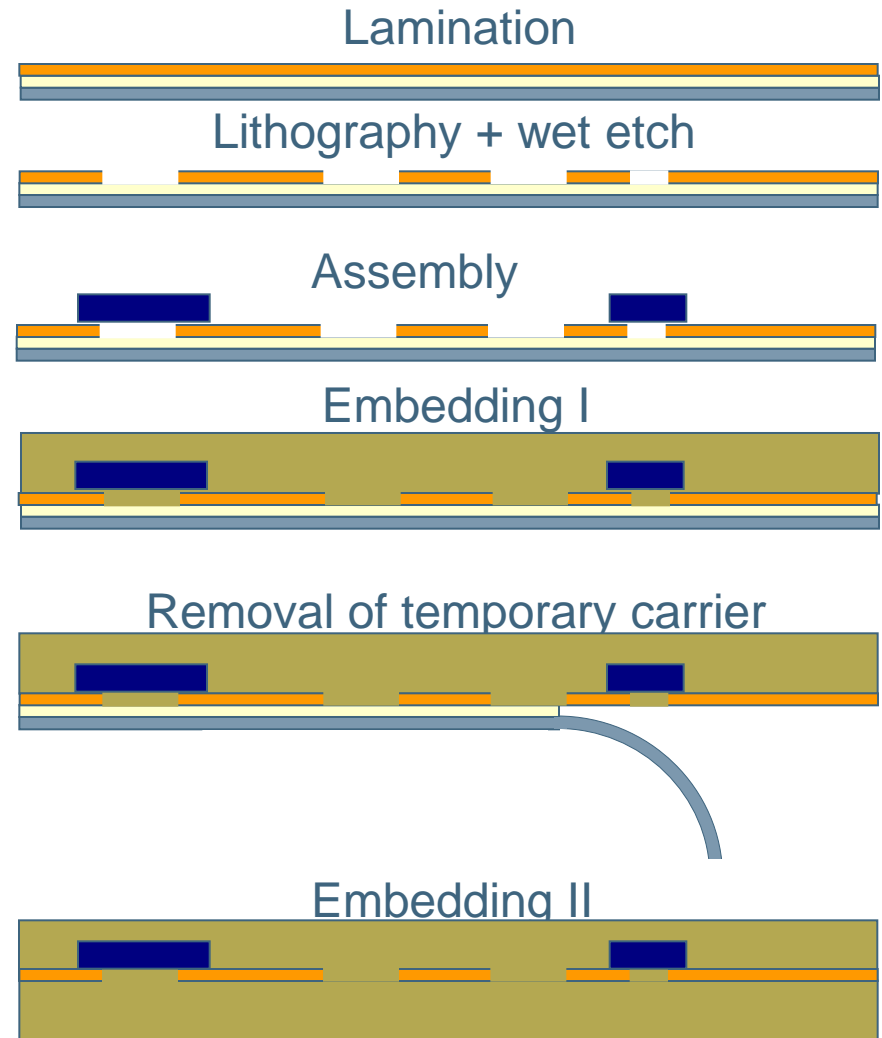
 carrier material must withstand harsh chemistry and high temperatures (260degC)

 materials choice for PCB carrier materials limited

# CMST SMI-technology (Stretchable Mould Interconnect) for stretchable circuits

-  copper
-  Temp. adhesive
-  Temp. carrier (PI, FR4, glass...)
-  Silicone, polyurethane
-  Component, interposer

- All PCB processing steps (circuit fabrication, component assembly with lead-free solder) are done on a temporary carrier
- Final (stretchable) carrier material is applied at the end of the production process

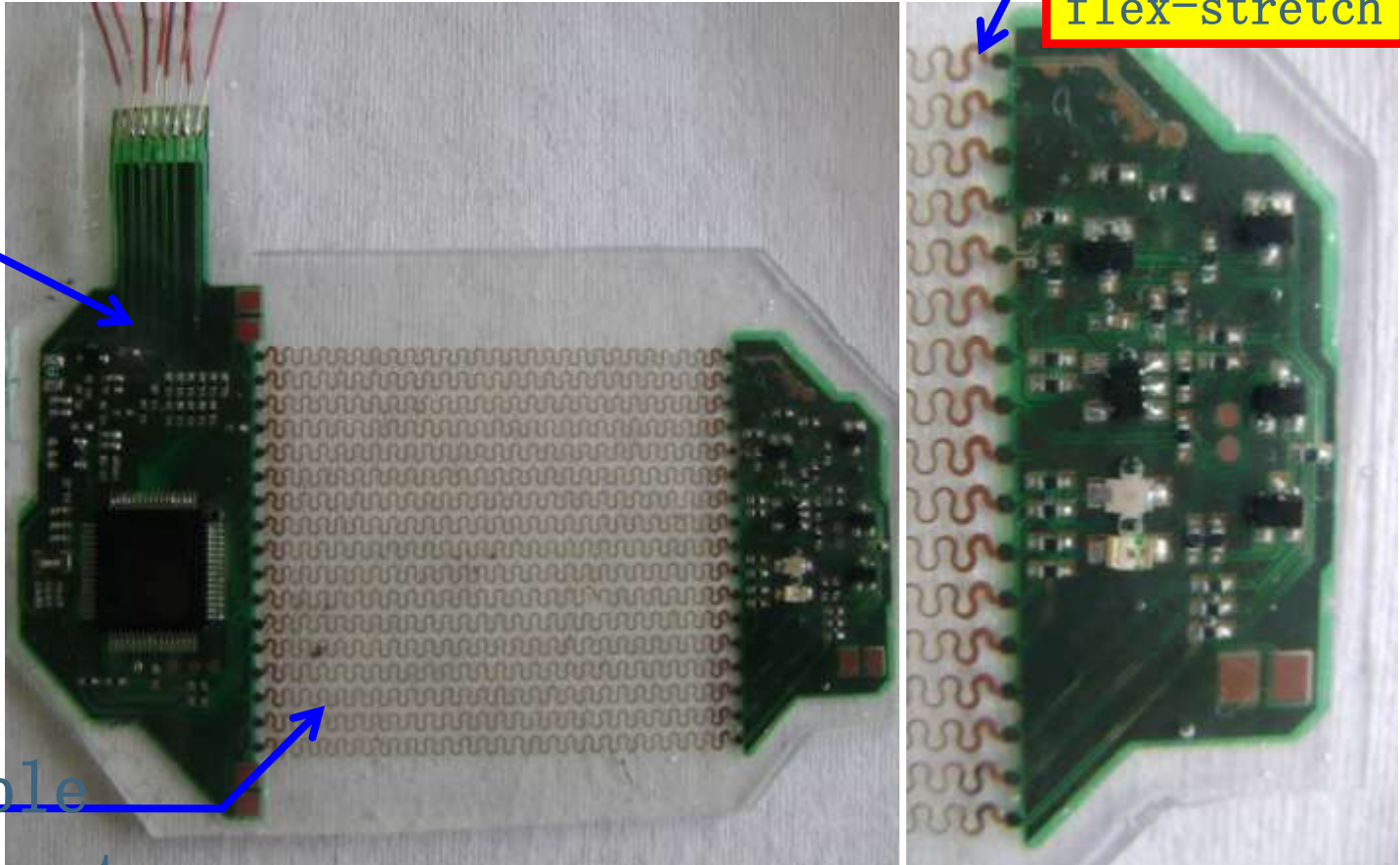


# Potential for quite complex circuitry

Verhaert EC-STELLA demonstrator: baby respiration monitor

Component island

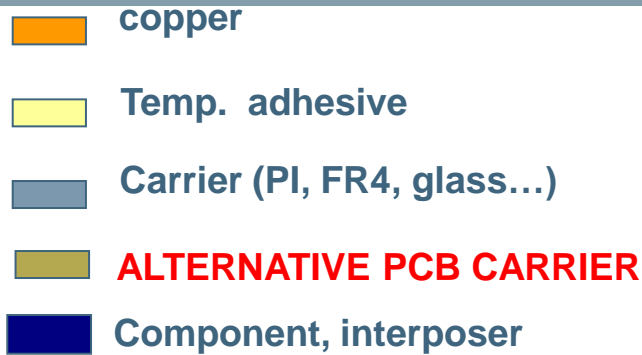
Smooth flex-stretch tr



Stretchable interconnects

Embedded in silicone rubber Dow Corning - Sylgard 186 by casting / Liquid Injection

# Extension of SMI-technology → other classes of alternative carrier materials

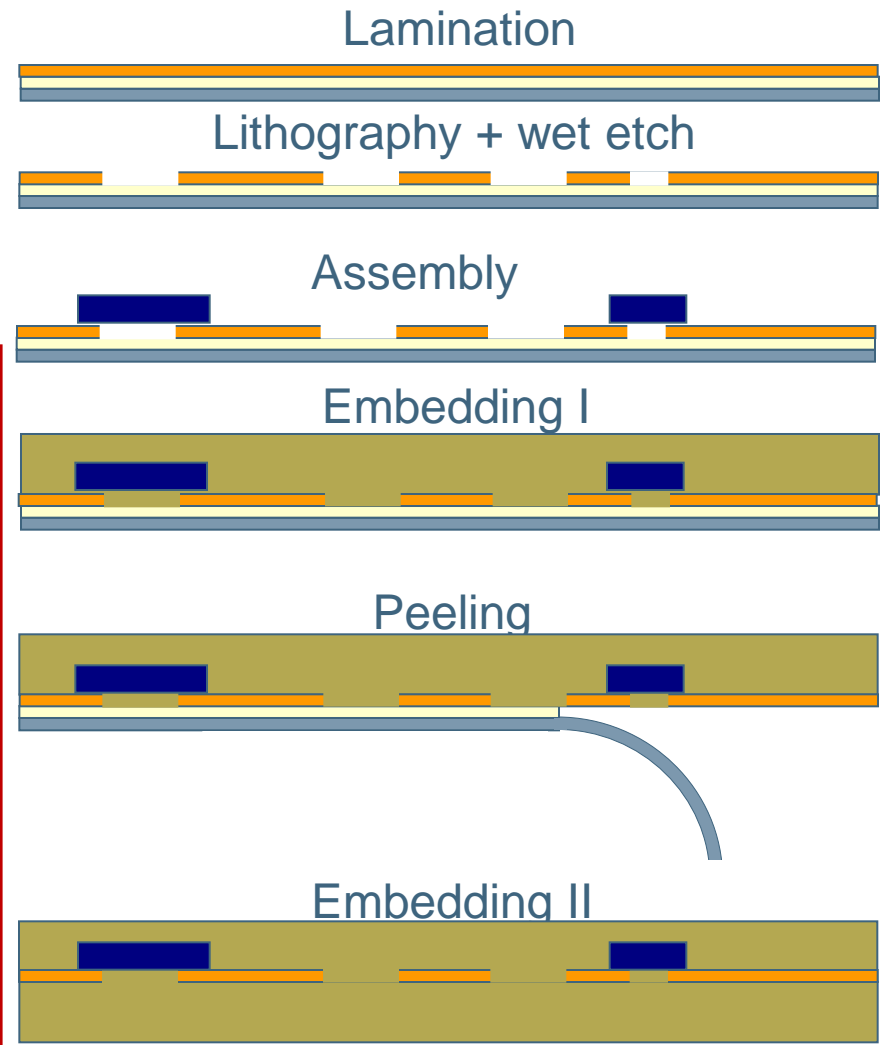


• Alternative carrier not subjected to high temperatures during process → much wider choice !

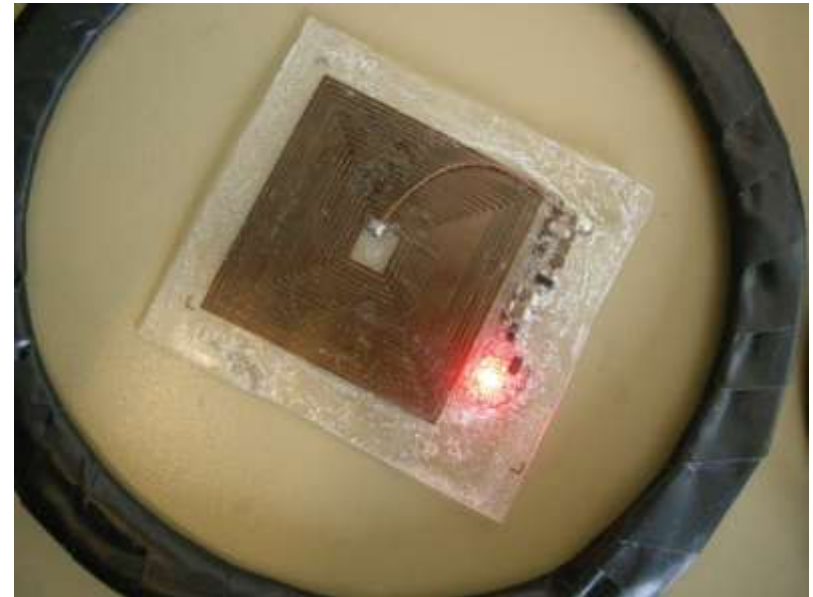
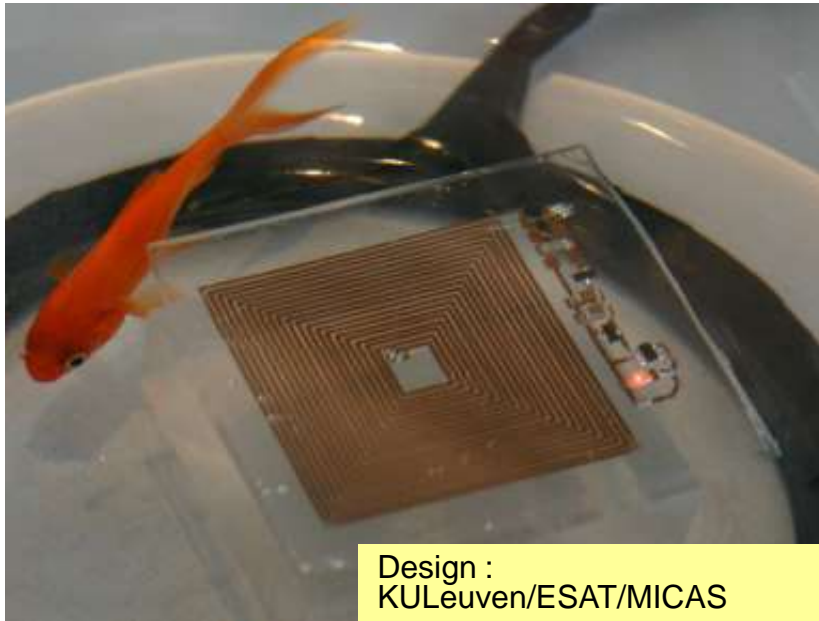
• New classes of PCB carriers :

- thermoplastic materials → 1-time deformable & 3D free-form circuits
- biopolymers → potential for easy recycling / disposal at end of life
- (textiles, fibers, ...)

• Application of materials by casting, molding, lamination, spraying, hot embossing... (flow over circuit & components)



# Example : biopolymer as carrier material



**inductive link,  
driving a LED,  
embedded in PDMS**

**Same Inductive link,  
embedded in PCL  
(Polycaprolactone) =  
biodegradable  
polymer**

# CMST ACTION PLAN

IMEC – UGent / CMST is looking for (industrial) partners :

- (Polymer / textile) materials manufacturers and processing companies, PCB manufacturers and assembly companies, WEEE disassembly and recycling companies,...
- Discussion on viability / feasibility of this technology idea, additional applications, technological considerations,...
- Potential partners / members of users group in potential upcoming project proposals :
  - IWT-SBO
  - FP7/IWT-ERANET+ on OLAE (organic / large area electronics)



 imec

The imec logo features a stylized, black, circular graphic element on the left, resembling a swirl or a partial circle, followed by the lowercase text "imec" in a clean, sans-serif font.