



Manufacturing system for 3-D micro components built of stacked and functionalised polymer films



...since decades people are thinking about machines being able to rapidly prototype food, spare parts, components or even complete products...

SITUATION

Micro system enabled applications are high volume products building on a few micro components, e.g Si-MEMS or replicated, polymer-based devices. The demand for small and medium series of specialized components for key products is enorm but costs for process and production setup are high.

GOAL

- generative technologies (additive manufacturing and printed electronics)
- scale up from prototype to medium-size series
- cost efficient manufacturing of next generation 3D micro components
- rapid production of complex, micro enabled, mechatronic 3D devices
- increased flexibility and scalability of manufacturing processes
- product quality improvement
- reduction of development and scale up time
- reduced impact on the environment (energy consumption and waste)

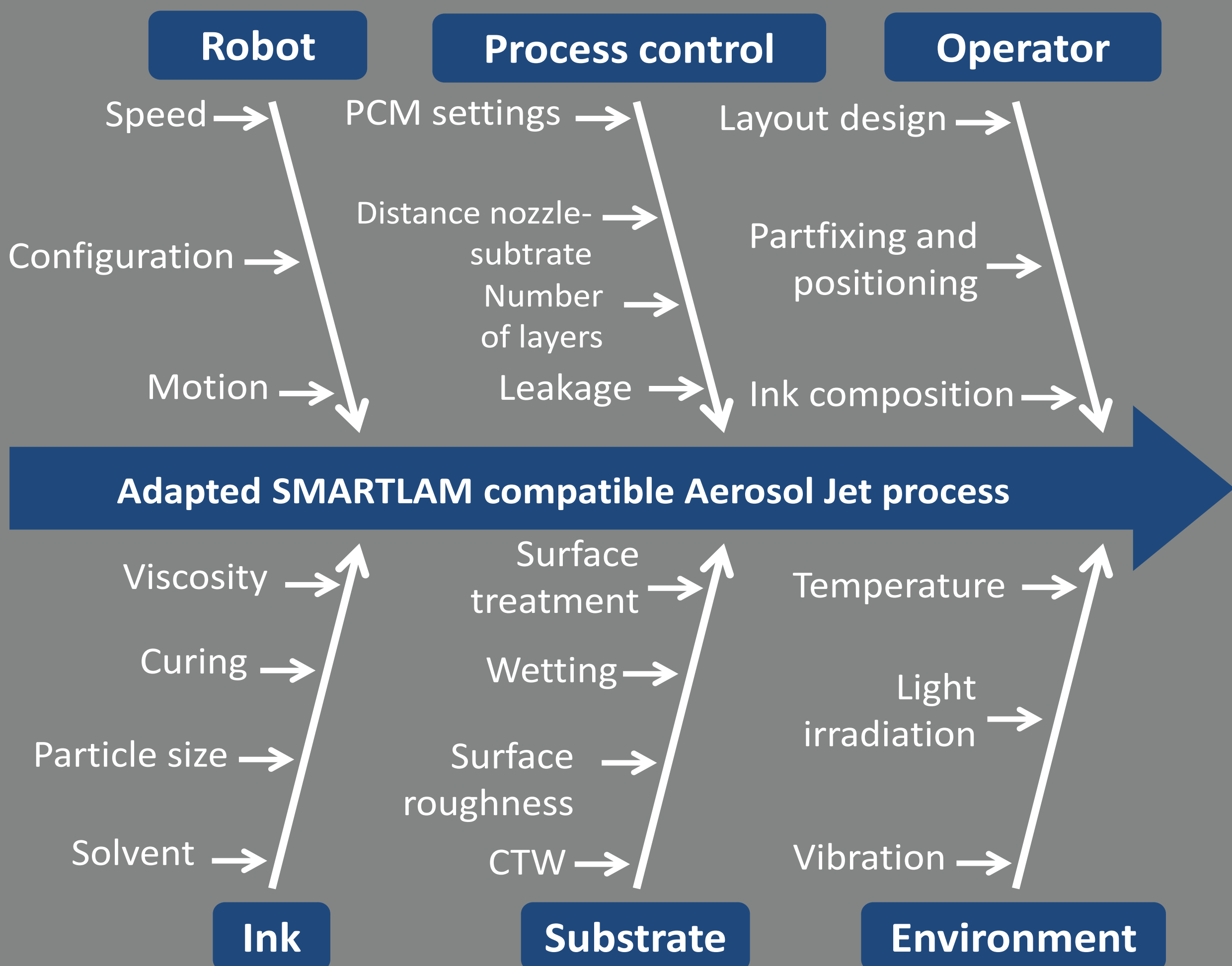
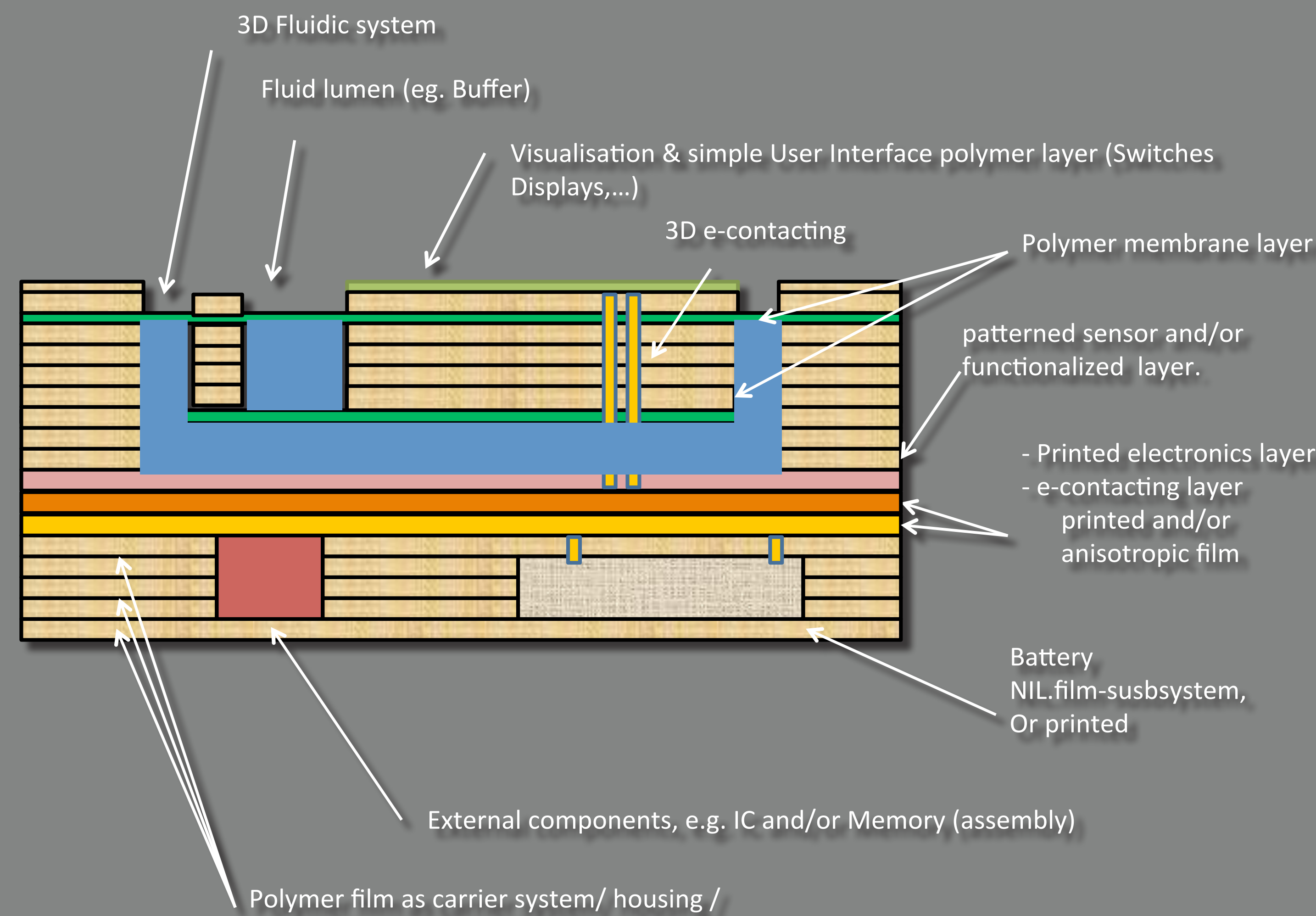
APPROACH

- lamination of thin polymer films with specific properties building on advanced material and surface properties for batteries, wiring, sensors, fluidics (structures and printed components)
- integration of assembly, laser milling, cutting, welding and 3D-printing technologies in one system

... SMARTLAM paves the ground for the next generation of system integration in equipment manufacturing towards a "Star Trek"- like manner, building on a flexible, scalable manufacturing environment ...

Case study for micro fluidics parts

SMARTLAM –3D Function Integration through intelligent combination of Film Layers - Principle

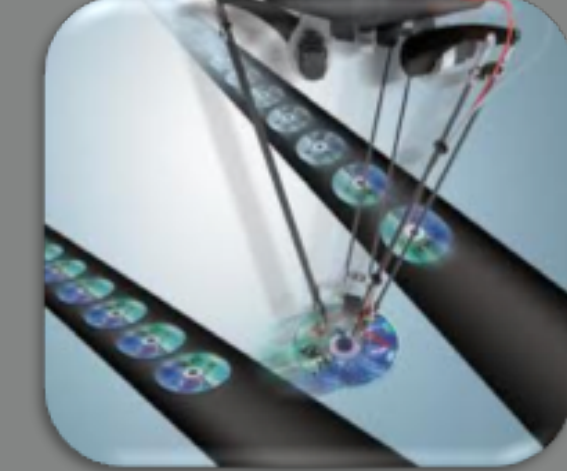


SMARTLAM Modules

3D-I Modelling & design approach



3D-I compatible production platform



SMARTLAM adaptive control and vision inspection

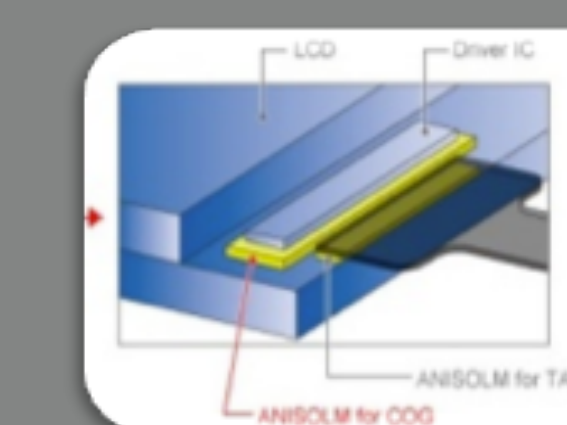


3D- Aerosol inkjet printing



Handling of polymer films

MicroLaser cutting, milling, welding sintering



materials with advanced properties