FP7 piezoVolume 2010 - 2013

High volume piezoelectric thin film production process for microsystems

Current market situation – piezoelectric MEMS with PZT

- Some large companies are working with PZT piezoMEMS
  - Ink-jet print heads
  - High f ultrasonic transducers (medical)

Medical ultrasonic transducer by Vermon

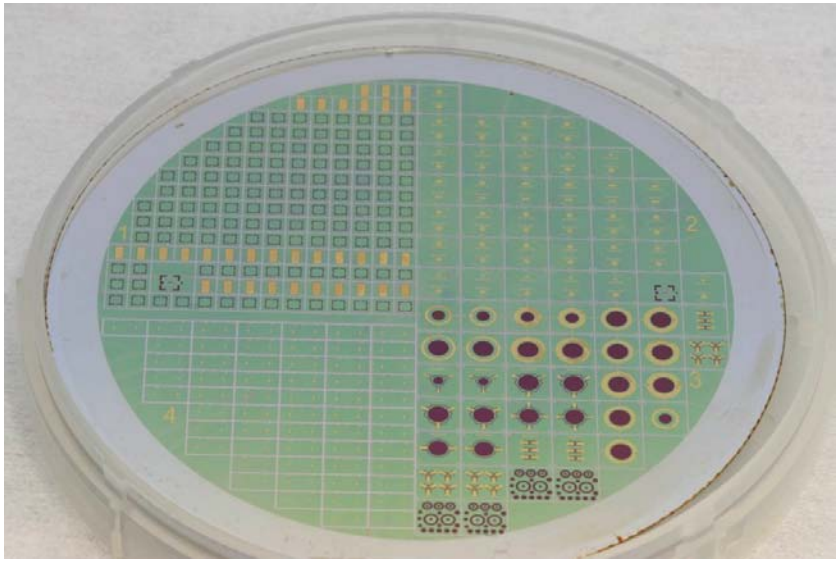
- Small and medium companies/ Universities have ideas where piezoelectric PZT technology is needed
  - Need access to PZT based piezoMEMS foundry

Ink-jet printer by Océ

- Companies are looking for high volume production solutions for PZT
  - Prototyping
  - Deposition
  - Fabrication

Current situation regarding low volume prototyping

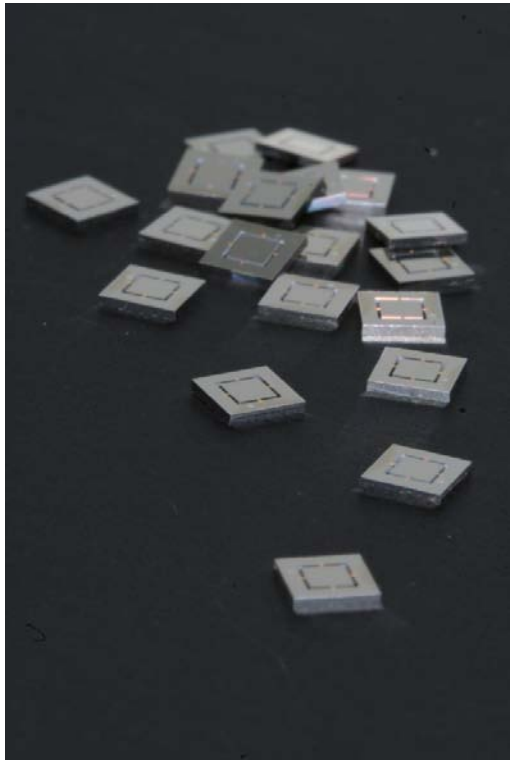
- In, Europe there are a few Universities/Institutes that offer piezoMEMS feasibility studies:
  - Cranfield University (UK), PZT
  - SINTEF (NO), PZT
  - EPFL (CH), AlN and PZT (research)
  - Fraunhofer ISIT, AlN (DE)
  - IMEC, AlN (BE)
- Only SINTEF has a predefined process with design handbook and fabrication procedure (moveMEMS)



Multi-project piezoMEMS wafer from SINTEF

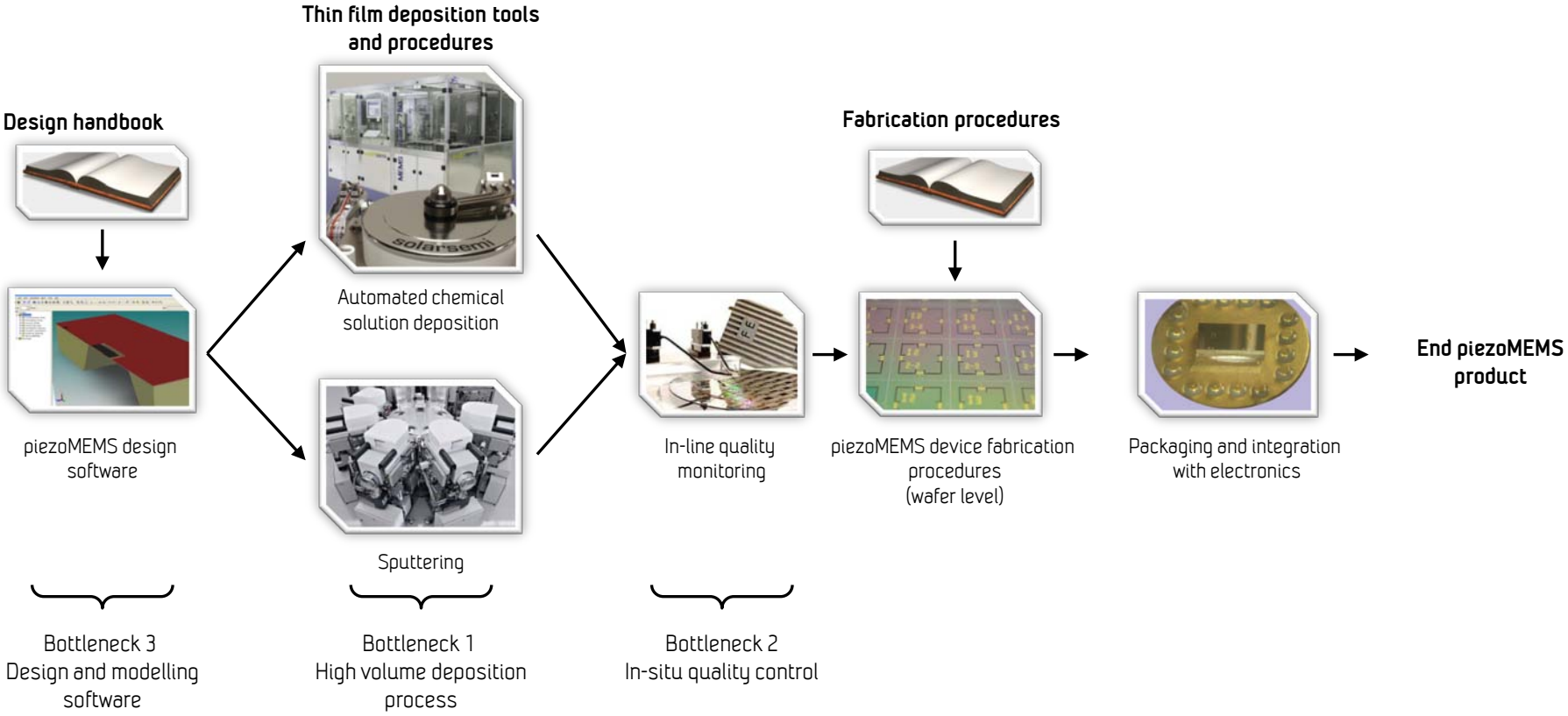
Current situation regarding high volume fabrication of piezoMEMS

- There are 3 main bottlenecks for high volume fabrication
- piezoVolume develops commercial solutions to remove these bottelnecks:
  - High volume deposition
    - AlN process already commercial (sputtering)
    - Commercial PZT process being developed by piezoVolume and several companies
  - Quality monitoring tool (piezoelectric coefficient)
    - being developed in piezoVolume
  - piezoMEMS design and modelling tools (+procedures)
    - being developed in piezoVolume



piezoMEMS accelerometers (SINTEF)

The piezoVolume piezoMEMS fabrication process



piezoMEMS competence centre

- The competence centre aims to act as contact point for interested parties and covers the whole production process for piezoelectric microsystems

- World-class piezoelectric thin films (PZT). $e_{31,f}$ ~ -14 C/m^2 @ 10 Hz
- Deposition process and tools for high-performance PZT thin films on silicon wafers
- Modelling software specifically for piezoMEMS
- Modelling of device ideas and design assistance
- Evaluation of alternative processing routes
- Testing services and sophisticated testing equipment
- Manufacturing of prototypes
- Small scale production using 150 mm wafers

- www.piezovolume.com