

# SilMach

MEMS Technology

France



ANSYS® Multiphysics™

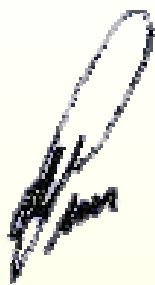


## Overview

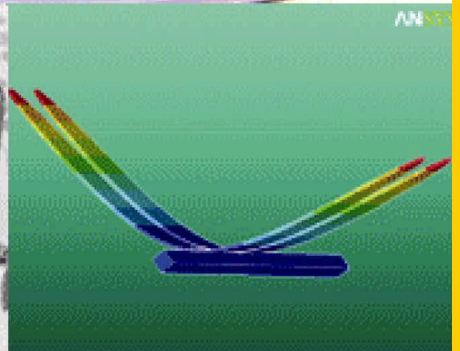
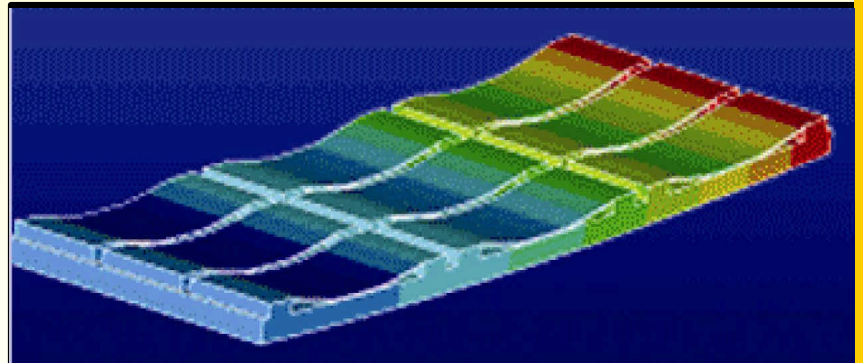
SilMach is a spin-off from the LMARC/IMFC based in Besançon, France and is a young MEMS design, simulation and prototyping R&D company. The core company skills include MEMS technologies for new electromechanical devices combined with electronic circuits. SilMach's mission is to provide MEMS R&D dedicated to conceptualization, design, simulation and prototyping of highly integrated silicon-based actuators and systems.

## Testimonial

"A decisive advantage offered by MEMS technologies is the possibility of implementing sensors and actuators within arrays. This requires knowledge of the different physics of each section of the device required for it to work. ANSYS Multiphysics enables us to couple these physics and accurately predict their performance."



**Patrice Minotti**  
Chairman, SilMach  
CNRS Research Director



### Challenge

MEMS devices are expensive to prototype and therefore need to be simulated prior to manufacture to make sure that they perform as designed.

Accurately predicting their performance requires sophisticated coupled physics analysis tools which allow these complex problems to be solved.

### Solution

By using ANSYS Multiphysics, SilMach has the ability to solve complex coupled physics to create sensors and actuators within arrays and predict their performance before committing to manufacture.

Coupled physics such as mechanical deformation and nonlinear contact effects with acoustic, electrostatic, thermal and fluid damping can be achieved using ANSYS Multiphysics.

### Benefits

ANSYS Multiphysics has enabled SilMach to create more efficient MEMS devices such as a conventional electromagnetic actuator producing 100 Watts per gram compared to 1 Watt/g for standard devices. Also they can continue to research other advanced topics such as:

- MEMS-based gas microturbines
- MEMS-based flap arrays for active control of turbulence,
- Flapping wing propulsion systems for artificial insects and nanometer scale UAVs...