

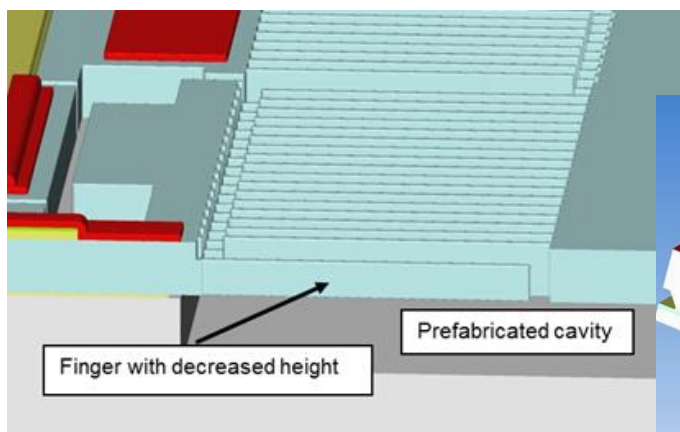
Some important technical features, specifics of the MEMS process for inertial sensors:

- The result of the process is a wafer-level bonded, two wafer stack with hermetically sealed, released (inertial) sensor structures:
 - Wafer 1: SOI sensor wafer with prefabricated cavities for the released structures (combs, masses, beams,)
 - Wafer 2: silicon top cap wafer, structured by KOH etching
- **Capacitive** actuation and sensing
 - Released structures created from crystalline silicon
 - Special comb fingers with decreased height for out-of-plane actuation
- only one metal layer to contact structures on the sensor wafer
- Typical applications: inertial sensors like accelerometers, gyroscopes, vibrating structures/sensors.

Boundary conditions of the MEMS process:

- The **sensor process** is qualified, the introduction of **additional materials, implants and process steps is not possible; the process flow is fixed**. Consequently it is not possible to introduce additional piezoelectric materials like PZT, additional thin membrane/cantilever structures and to modify the thickness of the released silicon structures (typically 15 μm) except for fingers with decreased height.
- No top or bottom electrodes for actuation or sensing are available, out of plane actuation is realized by comb fingers with decreased height.
- No direct on-chip integration of CMOS is possible; the final MEMS sensor will be a discrete chip.

Please take into account these “hard” facts for the necessary specification/redesign of your proposal: **the proposed application must be compatible to X-FAB’s inertial sensor process**. For illustration of typical process results two 3D emulation pictures are attached.



Structured sensor wafer (red: metal)

Example of the final wafer stack: hermetically capped sensor structure (left) and KOH etched top cap window for wire bond (right)

