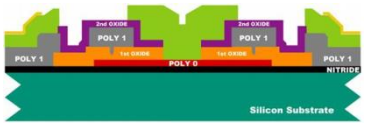
Europractice-MUMPs MPW service

EUROPRACTICE IC Service offers Multi-Project Wafer Services in MEMSCAP's MUMPs® processes:

The Europractice MEMSCAP MUMPs® MPW service is aimed at creating, characterizing and evaluating test structures prior to further specific development and production projects. Three distinct MEMS processess are available:

MEMS-technologies

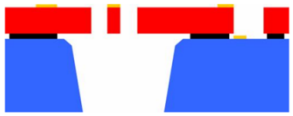
PolyMUMPs™



Devices that can be made in PolyMUMPs include:

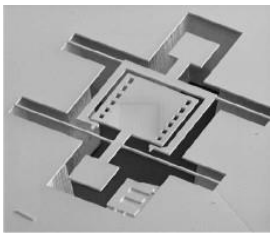
- Acoustics(microphones)
- Sensors
- Accelerometers
- Micro-fluidic
- Robotics
- Display technologies, …

SOIMUMPs™



SOIMUMPs is suitable for:

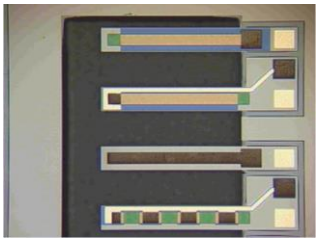
- Gyros
- Optical Devices
- Display Technologies…



PiezoMUMPs™

Devices that can be made in PiezoMUMPs include:

- Energy harvesters
- Sensing
- ultrasonic transducers
- Microphones
- Actuators



Europractice MEMSCAP MUMPs MPW Pricelist 2019

EU-Discounted Price only applies to EUROPRACTICE registered (who paid their annual full membership fee) Academic and Research Members from all 28 EU countries and Albania, Armenia, Azerbaijan, Belarus, Bosnia-Herzegovina, Georgia, Iceland, Israel, Liechtenstein, Former Yugoslav Republic of Macedonia, Moldova, Montenegro, Norway, Russia, Switzerland, Turkey, Serbia and Ukraine who submit designs for educational or publicly funded research use only.

For 1 location "Standard Die Site"	Standard Price	EU-Discounted Price
All MUMPS	3550 €	3350 €

Standard Price normal price for universities and research institutes not belonging to previous category.
(Companies should contact the foundry directly)

- Accessible for universities and research institutes. (Companies should contact the foundry directly)
- *Prices and conditions may change at any time without prior notice.*

- For each design submitted (one location), MEMSCAP delivers 15 dies.
- Extra dies: 1500 € per group of 15 extra dies
- Optional Post-Processing
  - Subdicing (PolyMUMPs): 200 € per cut per 15 die of any size from the same die location
  - HF Release: 800 € for up to 15 die of any size from the same die location
  - Supercritical CO2 Dry + HF Release: 1800 € for up to 15 die of any size from the same die location

Note that available post-processing options depend on technology: see table overleaf

Europractice MEMSCAP MUMPs MPW runs in 2019

MEMSCAP	J	F	M	A	M	J	J	A	S	O	N	D
PolyMUMPs			26			25			17			**16**
SOIMUMPs		19			21			21			26	
PiezoMUMPS	15				7			27				

Europractice-MUMPs MPW service

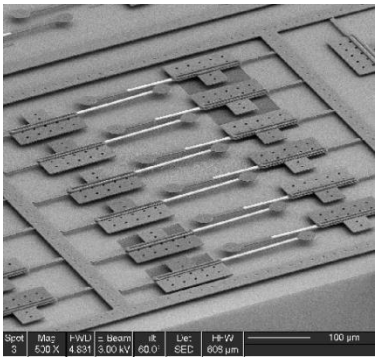
Why Use Europractice-MUMPs® ?

Europractice-MUMPs® is low-cost with quick turnaround. The processes are well established standard processes so the properties and layer-to-layer dynamics are well-understood and documented. Using Europractice-MUMPs® leads to fewer design iterations, lower- and fixed-cost development, and less potholes in the road to both functionality and volume production.

How does Europractice-MUMPs® Work ?

Europractice-MUMPs® is a shared wafer or multi project wafer service, meaning customers purchase one or more individual die locations(1cm x 1cm size) or tiles on any regularly scheduled run, then create and submit a design based on the process design rules. Eight to 12 weeks later, the customer receives 15 identical chips of their design.

Chip characteristics



		PolyMUMPs	SOIMUMPs	PiezoMUMPs
"Standard Die Site"	Fixed die size (mm²)	10 × 10	11 x 11	
	Active area (mm²)	9.8 × 9.8	9 × 9	9 × 9
	Number of dies delivered	15 dies		
Optional post processing	HF release	possible	Not applicable	Not applicable
	HF release and CO2 Dry	possible	Not applicable	Not applicable
	Subdicing	possible	By design or optional laser dicing	By design or optional laser dicing

PolyMUMPs™

PolyMUMPs is the industry's longest-running MEMS multi-project wafer service, with over a decade of history. Many universities use the service today as a way to teach beginning MEMS design at the undergraduate level, using PolyMUMPs as the "example" process.

PolyMUMPs is a three-layer polysilicon surface and bulk micromachining process, with 2 sacrificial layers and one metal layer. Eight mask levels create 7 physical layers. The minimum feature size in PolyMUMPs is 2µm.

SOIMUMPs™

SOIMUMPs uses a SOI wafer with a thickness of 10µm or 25µm and allows the designer to pattern and etch both sides of the SOI wafer down to the buried oxide, enabling through-holes to pass light through. Two metal layers, one for bond pads and one for reflectivity, are included in the Standard Process. The minimum feature size in SOIMUMPs is 2µm.

PiezoMUMPs™

The PiezoMUMPs process is based on the SOIMUMPs process with 10um SOI thickness. Its distinguishing feature is a piezoelectric layer of AlN. Top-contact to the piezoelectric layer and the SOI is enabled by means of a patterned layer of Metal. Patterning of the oxide layer that separates the SOI and the AlN allows for contact between the latter. Patterning of the SOI and openings in the handle silicon are available as is the case for SOIMUMPs.