

Fabrication of titanium MEMS

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MISTIC is at the heart of a brand-new technological field involving MEMS out of titanium to manufacture the next generation of implantable microdevices. Titanium is indeed the biomaterial of choice used in the implantable industry. From now on, the standard micromachining techniques of Titanium are limited in terms of resolution and tolerances which inhibits the definition of ultra-miniaturized features. On the other hand, Titanium remains a purely passive mechanical material used only to package non biocompatible silicon based sensors, thus making impractical the developments of implantable sensors at cost-effective levels.

To overcome these limitations, the company and its academical partners developed a portfolio of technological processes, which were transposed from the silicon industry and adapted to wafers out of bulk medical-grade Titanium.

Many processes (lithography, etching, thermal oxidation...) have been created to manufacture functional components such as an implantable pressure sensor. These components are then integrated into the passive titanium housing of active implantable medical devices such as pacemakers through conventional laser welding.