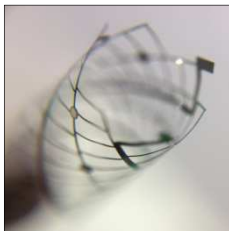


Capabilities of Nitinol thin film technology

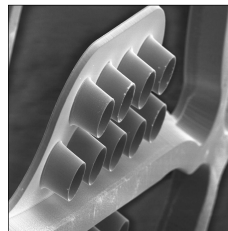
Acquandas offers an **enabling technology** to fabricate components and devices for disruptive medical therapies and industrial applications. This novel technology addresses several limitations of current fabrication technologies (structuring by laser cutting):

- **Miniaturisation**
- **Design freedom**
- **Fatigue resistance**
- **Radiopacity**
- **Integration of additional functionality**
- **Rapid response / prototyping**
- **Costs**

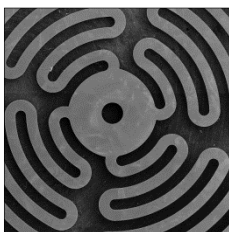
The devices that can be fabricated with Acquandas' process can be divided into **three platforms**. These platforms are:



Bioelectronics



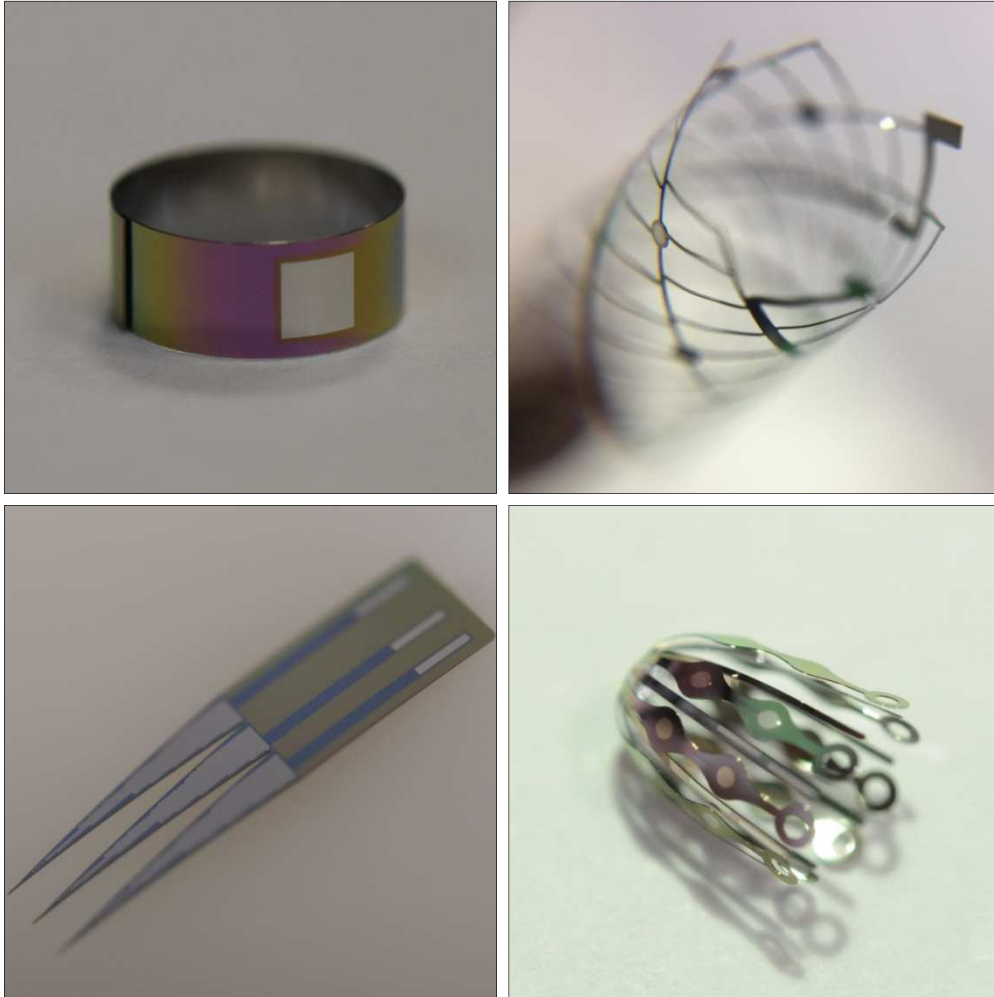
>Smart< Components



Actuators & Springs

- **Bioelectronics**

Acquandas' microsystem technology allows depositing different materials on top of the flexible, biocompatible, structured Nitinol thin film devices. Those devices can be fabricated in customized geometries, e.g. stent or cuff like shape (see images below). On top of Nitinol, conductive, magnetic or piezoelectric materials (isolated from the Nitinol layer) can be patterned with high resolution, enabling extra functionality, such as bioelectric sensing, stimulation, etc...



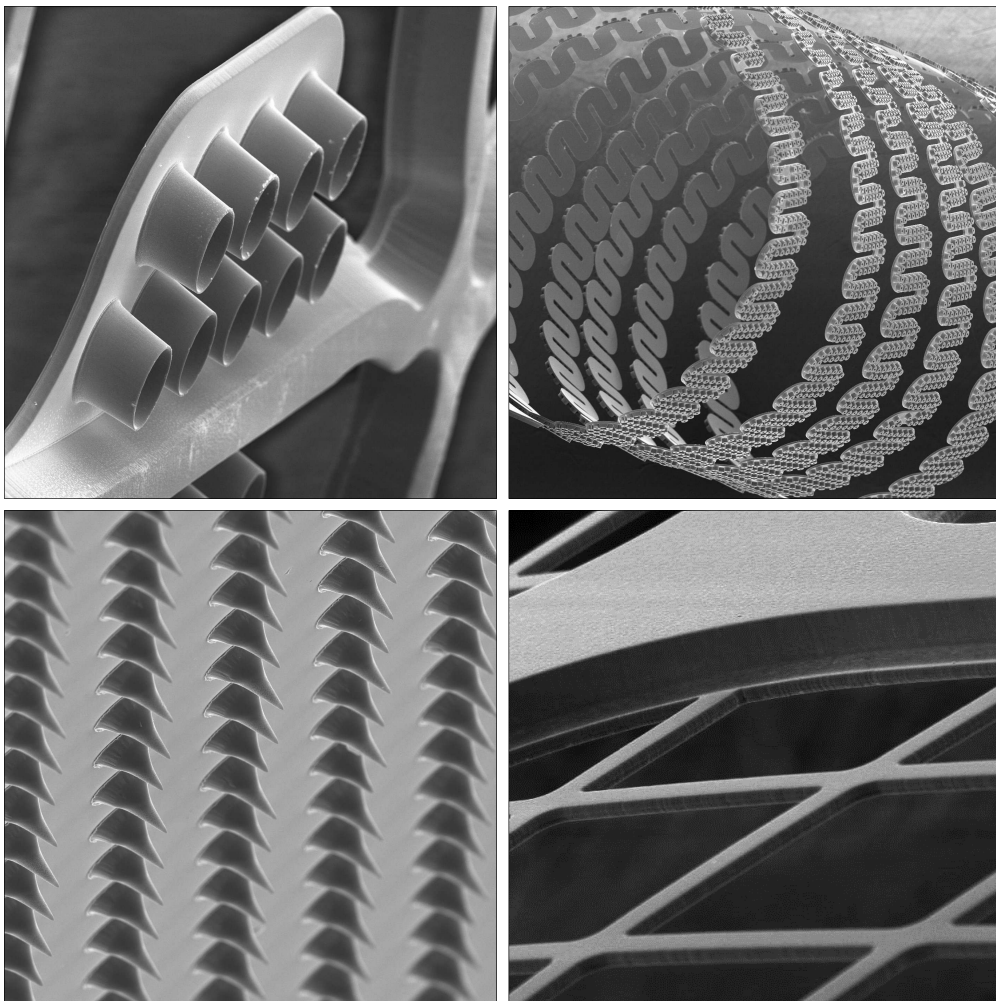
Different Nitinol thin film substrates with isolated conductive paths, e.g. cuff or stent like structure with arrays of micro electrodes. Isolation is obtained via non-conductive oxide layers (blue, green or yellow color).

- **>Smart< Components**

Using Nitinol thin film technology, customized structures with highly complex geometries can be fabricated. These geometries can be for example:

- devices with a micro-patterned strut surface
- stents with small flaps that act as flow diverters for aneurysm treatments
- surfaces with cups that are filled with drugs for optimum drug release profiles
- surfaces with a high density of micro-needles
- large area membranes with small pore size, but high mechanical stability.

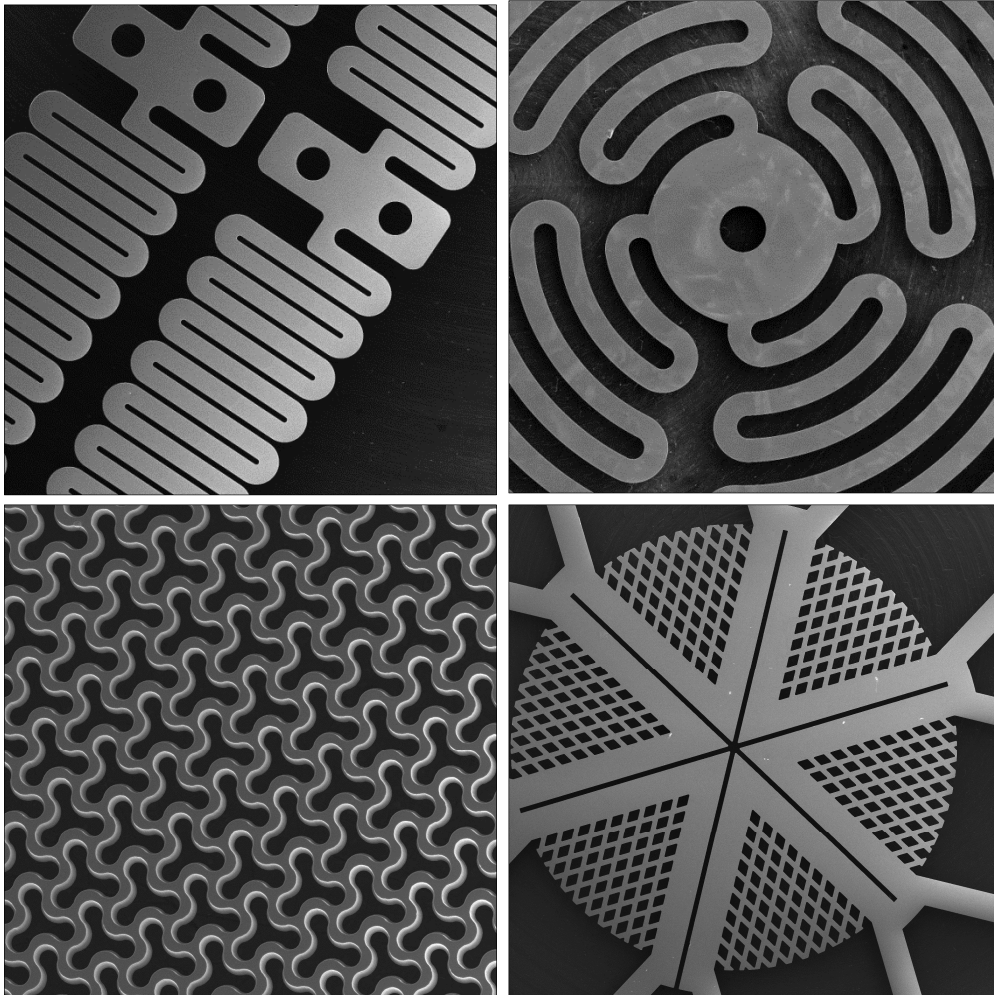
Also, to increase radiopacity of medical components that become smaller and smaller, thousands of X-ray markers (e.g. Tantalum) can be placed on Nitinol thin film components, which make them visible during implantation while maintaining the superelastic properties of the device.



Nitinol devices with high geometrical complexity, e.g. cups for drug eluting stents, micro needles, or fine meshes supported by scaffolds with high mechanical stability.

- **Actuators & Springs**

The possibility to fabricate customized high precision thin film shape memory actuators that exhibit high work output, high fatigue resistance and 2D design flexibility enables novel micro springs, valves, pumps and other actuators. High temperature NiTi-based alloys or alloys with extremely high cyclic stability are also available.



Selection of Nitinol thin film actuator, valve and spring designs.

For more information about the materials and structures we can deposit, please contact us!

About ACQUANDAS GmbH: ACQUANDAS GmbH is a technology company that supplies thin film components to the healthcare industry – in particular to medical device OEMs – and other industrial markets, such as the automotive and consumer electronics industries. ACQUANDAS is located in Kiel, Germany.

Based on state-of-the-art microsystem technology processes, we fabricate an entirely new generation of metallic components for applications in medical devices and many other products. The combination of properties that our devices have is unique: miniaturized structures with high geometrical complexity, integrated micro-electrode arrays, increased radiopacity, high feature resolution, excellent biocompatibility and improved mechanical properties!

We look forward to working with you...