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Micro Technology Services

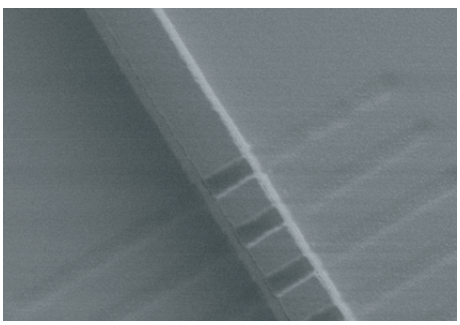
Micro Technology

Micro (System) Technology (MST), disruptive of nature, has become mature and examples have been created to encourage industry not only to acknowledge the potential of the technology, but also to actively start developing it for their own products.

Besides the development and production of integrated optics and microfluidics based devices, LioniX provides micro technology services based on processes and equipment at the world-famous MESA$^+$ Research Institute of the University of Twente. The MESA$^+$lab is a flexible and professionally managed clean-room facility (for details see www.mesaplus.utwente.nl).

In addition, LioniX has its own clean-room facilities with equipment for the proprietary technology (SiO_xN_y, ZnO) and dedicated test equipment for integrated optics and microfluidic devices.

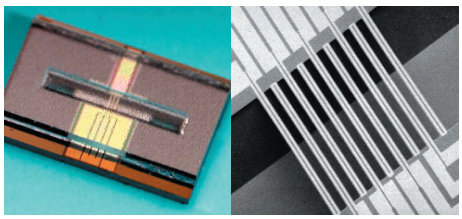
Through the link with MESA$^+$ LioniX is involved in Nano Technology as well, which will be of value in the (near) future.



Submicrometer waveguide (width 600 nm) with grating (pitch 300 nm)

Applications

MST has been brought to a level, which is mature enough for implemention in innovative products. Well-known examples can now be found nearly everywhere such as the pressure, flow and accelleration (airbag) sensor for automotive applications, inkjet printing heads and disposable pressure sensors for medical applications. These are examples in very high volume markets with low added value.
More highly added value microsystems are less familiar, such as the micromechanical devices in the lens systems in the lithography equipment for the semiconductor industry, magnetic printing heads for industrial printing, flow sensors for industrial applications and telecom components (optical cross connects, modulators/demodulators).



Micromachined flow sensor (channel width 500 µm)

Our services

LioniX provides single step foundry services as well as processing of complex structures and components. LioniX' microtechnology services are particularly useful for companies developing MST/MEMS-based products, but who fail the access to critical technologies.

Our processes are performed on 100 mm silicon, SOI, borosilicate, fused silica and other substrates. We work with carefully selected wafer manufacturers who deliver on request single/double side polished, doping levels, roughness, bow/warp etc. You can also ship your own wafers, blank or processed.

Processes

- silicon-oxynitride (SiO_xN_y) with refractive index 1.45 – 2.00
- low-stress silicon nitride (Si_RN)
- stoichiometric silicon-nitride (Si_3N_4)
- polysilicon
- PECVD silicon-oxide (SiO_2)
- thermally grown thick SiO_2
- sputtered zinc-oxide (ZnO)
- metallization (Cr, Al, Ni, Au, Ag, Pt, Wo, Ti, Cu, ...)
- wet and dry etching techniques
- deep RIE of silicon, oxides and glasses
- CMP (chemical-mechanical polishing)
- wafer bonding (anodic, fusion, direct, ...)

Deep RIE of borosilicate glass for microfluidic channels (width 75 µm, depth 50 µm, profile 85 degrees)