

Controlled flow micro-dispenser

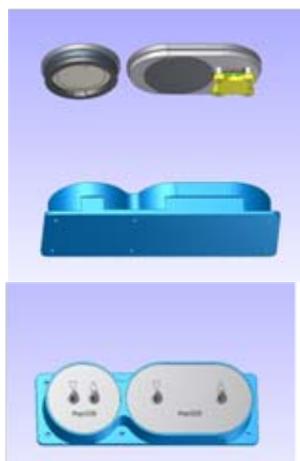
thinXXS Microtechnology has developed an integrated micro dispenser module that combines a thinXXS micro-diaphragm pump and the microBUILDER flow sensor. The driving force behind the development was a BMBF (Germany – ‘Mikrosysteme’) sponsored project for development of peripheral technologies/devices for micro fuel cells. As a power source for portable electronics, the market for micro fuel cells is expected to achieve significant growth with improvements in production and lower costs.

The application itself requires a device which supplies a controlled flow of methanol to the fuel cell including temperature compensation. The thinXXS diaphragm micropump was selected and further developed for custom performance and to integrate a filter membrane in the housing. For the feedback control of the pump, the microBUILDER sensor was selected due to the novel design and existing interfacing standards. The sensor was mounted in a custom integrated polymer housing using the standards created for the mixed technology slide for silicon/glass integration.

The module was characterized and successfully demonstrated to maintain a desired flow under fluctuating backpressure and fluid temperatures. The micro dispenser-pump is suitable for a wide range of applications where precise control of flow in the range of 0.1 – 10 ml/min is necessary.

The microBUILDER consortium partners who contributed to the integration of the micropump and flow sensor include:

- Sensor design & fabrication (SINTEF)
- Sensor fabrication (SensoNor)
- Assembly components - flexboard (HSG-IMIT)
- Module fabrication, assembly, and characterization (thinXXS)



In conclusion:

It is demonstrated in this work that the microBUILDER flow sensor and standard assembly interface can be implemented efficiently into custom devices. Several members of the consortium were involved with the development of the flow sensor, which enabled the integrated module to be prototyped and characterized. It was determined that the flow sensor complements the thinXXS micropump and has distinct potential for future commercialization.

Contributing partners

