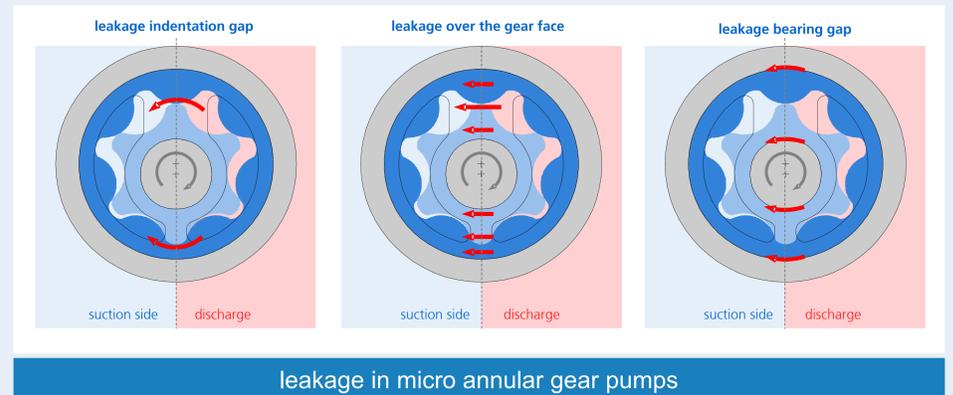


R&D at HNP Mikrosysteme in Centifluidic Technologies

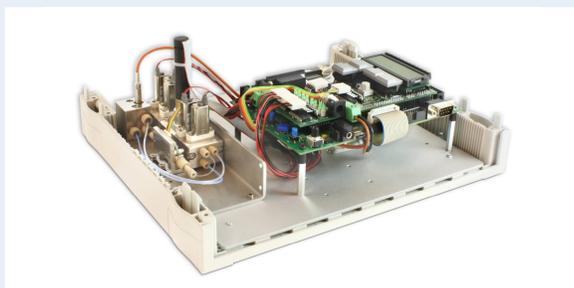
Modelling, simulation und experimental analysis of centifluidic systems

In close cooperation with the Institute for Fluid Technologies and Micro-fluidics at the University of Rostock, HNP M lays the foundation for further development of its product range on fluid-technical level. HNP M accompanies the CFD-simulation of the flow configuration in the pumps with the necessary experiments. The pump type inherent clearances between the functional components have an important impact on the efficiency of the pumps. The CFD-simulation provides the possibility to estimate the influence of changing tolerances on the functional components with low experimental effort. Additionally, the further technical development of the pumps with CFD will reduce the development costs and development times.



joint project 1

Cell-Mixer with packaged Cells as Ready-to-use Cells-Kits



Dispense Module

Together with the company CytoCentrics, HNP M is developing a sensor-controlled Dispense Module for Patch-Clamp-technology. It includes a "fluid block" with low dead volume and sensors for flow, pressure, temperature and air bubbles, several valves and a micro annular gear pump. Furthermore, it comprises an in-house developed controller software and necessary electronics. The Dispense Module is suitable for sequential dosing of very low volumes of several media. Typical dispensing values are in the range of 10 $\mu\text{l}/\text{min}$ with minimal pulsation and a required dispensing accuracy of $\pm 0,2 \mu\text{l}$.

joint project 4

Development of a rack-system and interface between components as well as material- and production-oriented pump gears

This project in cooperation with the company Dockweiler and the Institute for Physics at the University of Rostock deals with the further development of material- and production-oriented optimization of micro annular gear pumps.

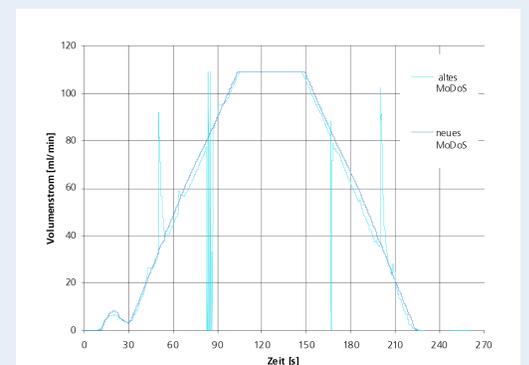
On the one hand, the rack-system MoDoS has significantly improved the accuracy of measurements through the flowmeter miniCORI-FLOW M14 and an optimized construction.

On the other hand, intensive research is done in new materials for functional components with high chemical resistance and high hardness for wear resistance.

Additionally, new manufacturing processes for pump gears are under intense scrutiny.



New modular dosing system MoDoS



Comparison of measurement accuracies at 16 bar

joint project 8

Author: Dipl.-Ing. Ellen Maus, HNP Mikrosysteme GmbH, Schwerin/Germany