# DEVELOPMENT OF A MICROFLUIDIC CARTRIDGE FOR AN ANALYTICAL DEVICE

Our customer is an international company in the field of medical technology and develops medical analysis equipment. For a newly designed multiparameter analytical device, konplan developed the microfluidic cartridge component.

**Development of several concepts for a microfluidic cartridge**
The requirements were determined and defined in conjunction with the customer. This gave konplan the basis for developing various, highly detailed concepts in 3D CAD. The main criteria were dead space optimized design, volume reduction, manufacturability, and automatability. The materials posed an additional challenge because the design was dependent on the material properties and must be adapted to them. Several concepts were implemented and tested to assess the critical aspects as part of the feasibility studies. An optimal solution was found that meets the requirements for tightness and automatability. The feasibility studies were successfully completed, the results documented, and the risks mitigated. Finally, the concept was further developed to the prototype phase, and several hundred components were semi-automatically manufactured.

**Material evaluation with equivalent alternative material**
The material evaluation was very important because the previously used materials were discontinued or did not meet the higher standards required. For components that have sample contact, the proper material selection is especially important to minimize the influence on function. The focus was on materials that are suitable for injection molding. Approximately 20 material distributors and injection molders were contacted for their suggestions which were then summarized and prioritized based on the existing properties. Concurrently, the test procedures for various test specimens were defined. Out of more than ten different materials, one was able to pass all tests and was subsequently used for successful performance and completion of the feasibility studies.

## Result
- Successfully verified feasibility
- Semi-automatically manufactured prototype of a microfluidic cartridge
- Replacement material with equivalent properties identified

## Methodology & Technologies
- SWOT Analysis, Agile
- Ansys, SolidWorks
- ISO 8015 (GPS)
- Climate chamber, leak test
- Experimental setup for air bubble detection

## Scope of Services
- Specifications development
- Concept creation
- Risk management, feasibility studies
- Material evaluation & testing
- Supplier coordination incl. initial sample testing and improvement loops
- Assembly & testing

4 years

1 employee – konplan

Conception, development, prototype

ilkonplan

ilk developing together