OPTIMIZING THE TEMPERATURE CONTROL FOR A MICROFLUIDIC CARTRIDGE

Our customer is an international company in the field of medical technology including the development of medical analysis devices. In conjunction with the new design of a multiparameter analysis device, konplan developed the temperature control system for the microfluidic cartridge. Based on the functional model, which was developed and tested by the customer, the component received further development for the prototype and series production models.

Development of the thermally optimized design
In close collaboration with the customer's electronics developer, konplan developed and optimized the mechanical components of the temperature control system for the new multiparameter analysis device. Using the functional model, the current situation was analyzed, and the performance of the existing temperature control system was compared with the customer's requirements. The resulting deviations enabled the specialist to outline solid concepts and define solutions for achieving the desired target values. In accordance with these concepts, the prototype version was iteratively improved and tested. The new design optimizes the structure of the cooling air ducts, improves the heat transfer properties, and integrates thermoblocks with Peltier elements.

Integration of temperature control throughout the system
Early climate chamber tests of the individual functions and the entire temperature control system in combination with iterative improvements proved that the new design satisfies all performance requirements. In the prototype version, the thermal components are successfully fitted into the limited space of the overall device. Also, the ability for reproducible component assembly has been simplified.

Result
- Improved design for temperature control in the prototype
- Temperature is within a narrower tolerance range
- More efficient heat transfer

Methodology & Technologies
- CAD Design, SolidWorks
- Scrum Agile Framework
- Climate chamber tests

Scope of Services
- Concept & Detailed Design
- Risk Management, dFMEA
- Test setups for functional testing

7 months

1 employee – konplan
1 Electronics Developer – customer

Functional model to Prototype, Analysis & Idea Generation, Conception & Development

ilkonplan

ilk developing together