Press release

Design for Manufacture – Enabling a Great Leap forward for Microfluidics!

A "Design for Manufacturing" Guidebook for the Design of Microfluidic Devices

Cambridge, 6th May 2014: There is considerable demand for devices that can quickly identify pathogens in blood accurately, that can monitor response to medication, or check the safety of food and water. In recent years several microfluidics-based devices for these and other "point of use" applications have entered the market. At the same time, hardly a day goes by without an announcement from a university group presenting a novel solution for another unmet need.

Most of these new and creative designs of microfluidics-based products fail on their way to the market or arrive there after long and costly iterations of (re-)development processes. Transferring a "proof of principle" research prototype of a microfluidic device to a production line takes too long and is often too expensive to be commercially feasible. This is the case for a wide variety of materials and manufacturing processes. An important part of the challenge is that researchers are often designing devices for the first time and stumble over multiple problems that an experienced designer might be able to avoid. The flip side of the same argument is that potential manufacturers are often frustrated when prototype designs presented to them are difficult, inappropriate or even impossible to manufacture in large volumes at reasonable cost.

A more manufacturing oriented design would bypass this stumbling block. The identification of this opportunity spurred a group of leading microfluidics organisations in the "Microfluidics Consortium", to produce a "Design for Manufacturing" guideline. This document, edited by Henne van Heeren from enablingMNT, contains a set of design guidelines, based on the expertise of consortium members working across a wide range of microfluidic techniques. It provides production design rules for the major industrial fabrication technologies used in microfluidics: glass/planar processing (including integrated electrodes), polymer/injection moulding and imprint techniques. The guidelines document contains several decision support charts and tables as well as suggestions for preferred chip sizes and microfluidic interconnections. It does not set a strict boundary for a design but it offers several options for a designer, all of them industrially supported and having an ability to be scaled up to high volumes. This document is available free of charge to researchers and developers around the world who are contemplating the creation of prototype devices containing microfluidics. Its purpose is to make developers aware of some of the "design for manufacture" issues, which, if dealt with early, can improve the probability of their device being manufacturable, economically and reliably.

Following extensive discussion with the members and outside experts at meetings of the Microfluidics Consortium in Boston, Ede and San Diego, the final version was presented on April 30th to Prof. Nico de Rooij. *"All industries come to the point where the focus of R&D transfers from using homemade improvised prototypes to working on the basis of industrially available components to achieve manufacturable designs. Microfluidics have come to this point and this Design Guide is its hallmark."* said Nico de Rooij, director of EPFL's Institute of Microengineering, Head of the Sensors, Actuators and Microsystems Laboratory SAMLAB and Vice-President of the CSEM SA. Professor de Rooij is one of the pioneers of microfluidics.

The Design Guidelines can be downloaded as a pdf from the Microfluidics Consortium's public domain website at http://www.microfluidicsinfo.com/DesignforManufacture.pdf

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