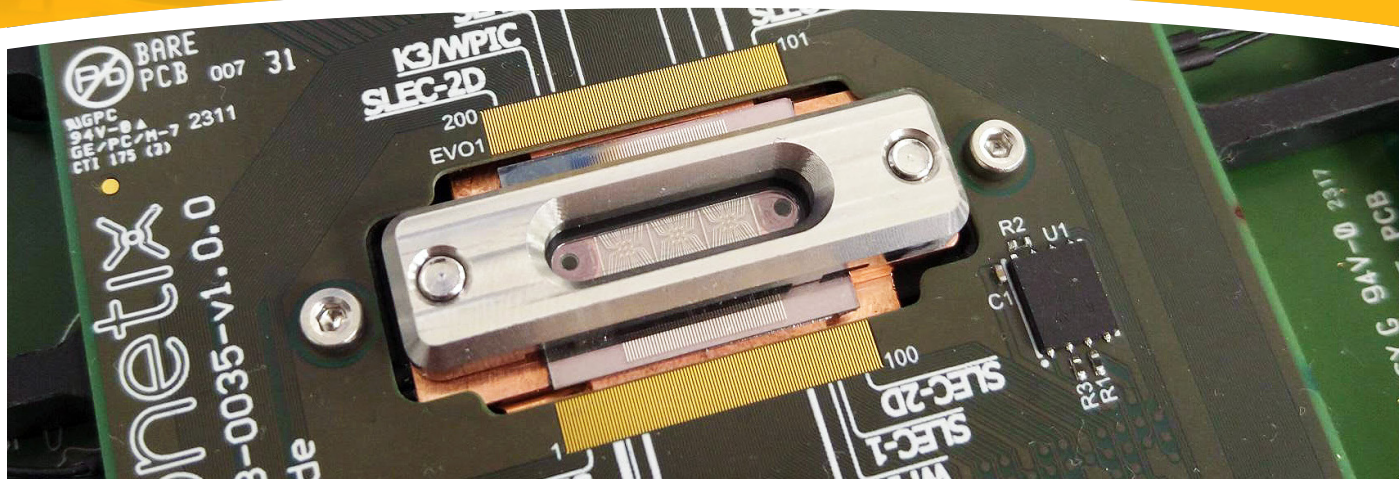




# dpseals

## CASE STUDY

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## Moulding the future of Gene Synthesis

**Evonetix is a Cambridge-based company developing a radically different approach to gene synthesis. Their desktop platform will provide scientists with the ability to synthesise DNA in their own labs at unprecedented accuracy, scale and speed.**

In effect this will enable laboratory scale platforms with industrial scale capabilities and puts the next generation of DNA technology into the hands of researchers working on the biggest challenges and opportunities facing our planet, such as petrochemical dependency, healthcare and personalised medicine, pandemic response, food availability, industrial chemistry and global data storage.

The platform contains a silicon chip with thermally-controllable sites where many independent DNA sequences can be synthesised in parallel. It also includes novel thermal error-correction technology which ensures the greatest quality in each sequence.

### The challenge

As part of the process a series of various different liquids flow across the surface of the chip, which is contained within a 1mm thick glass flow cell.

The flow cell has to seal against the chip surface using a removable seal which sits within a groove in the glass part. In this respect the seal required has to operate to the following criteria:

- Microscopic detail working to a circular cross-section diameter of 0.6mm
- Containing an internal pressure of around 5 bar
- Minimising compression force to avoid breaking the brittle chip

Evonetix contacted only a few suppliers with the potential capabilities of making the small parts to such tight tolerances. DP Seals' expertise in producing custom, micro rubber mouldings with industry leading tolerances has been established over many years and Evonetix were also impressed with their willingness to collaborate on this innovative project.

### The solution, goal and critical factors

In addition to the micro detailing, pressure and minimising compression force the seal manufacture must minimise flash and other defects. Due to the variety of liquids passing over the chip, material compatibility is also key so that the seal can deal with aggressive solvents, non-leaching, and ensuring that no contaminants are trapped between different liquid steps.

To achieve the required solution DP Seals worked closely with material compounders to develop a grade of FFKM that was tailored specifically for Evonetix; providing the right level of hardness to minimise compression force and a composition resistant to aggressive fluids.

For most rubber moulders the additional requirements of micro detail, tight tolerance and flash free finish to ensure non leaching and free flow of any potential contaminants would be a tall order, if not outside of capability. However DP Seals' patented, closed cavity, transfer moulding system helped deliver to the high level of specification.

*“ DP Seals have the greatest ability that I have come across in producing tight tolerances on small rubber components ”*

**Joe Fiabane**  
Principal Microfluidics Engineer

*Continues overleaf*

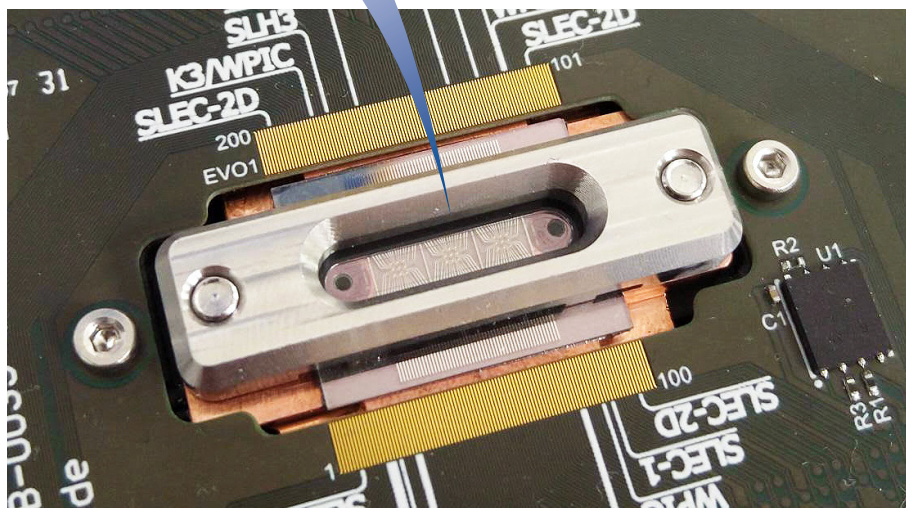
Whilst the product is still being developed for market, Evonetix have delivered DNA synthesised in this way to the Department of Chemical Engineering and Biotechnology at the University of Cambridge, demonstrating that the platform can successfully synthesise DNA using their patented thermally controlled semiconductor chip technology.

Joe Fiabane, Principal Microfluidics Engineer, said "DP Seals have the greatest ability that I have come across in producing tight tolerances on small rubber components. They have also been very willing to communicate, innovate and work hard to produce the quality that we need".

Andrew Piper, Managing Director at DP Seals added, "It's all in our DNA. This is another demonstration of our expertise in rubber material knowledge, micro mouldings and ability to work in close partnership with companies transforming their industries".



*Just 0.6mm in diameter, the seal is manufactured from a custom blend of FFKM to resist a variety of liquids and ensure no contaminants are able to affect the DNA sequencing process..*



*Examples of DP Seals flash-free rubber-to-metal bonded micro seals and mouldings.*



*Examples of DP Seals flash-free micro seals and mouldings.*

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