

CASE STUDY



Case #B0173

Perlast® micro seals for Upchurch 'Lab-on-a-Chip' analysis applications

Upchurch Scientific® is an industry leader in fluid-transfer components, specializing in the extrusion and molding of high performance engineering thermoplastics, and manufacturing tubing, fittings, valves and accessories for the HPLC market.

Lab-on-a-Chip applications are scaled-down versions of familiar laboratory procedures, such as liquid chromatography and capillary electrophoresis. Using chips often similar in size to a microscope slide, the technology boasts extremely small-bore passageways etched in silicon, quartz or glass. This miniscule scale facilitates the effective analysis of trace samples to an extent that cannot be achieved through conventional scale instrumentation.

The challenge in almost all chip-based applications comes in getting fluid in and out of the device. Upchurch NanoPorts solve this problem by bonding ports to the device's outer surface, creating a robust, reliable method for connecting flow-path tubing to the chip with fittings.

The Perlast seals, designed and manufactured by Precision Polymer Engineering (PPE) Ltd., are used to create an inert and biocompatible seal between the NanoPort and the chip surface. In addition, Perlast ferrules are used to create a seal between the tubing and the chip, while withstanding inline system pressures up to 1,500 psi (103 bar).

Mark Kincy, marketing manager of Upchurch Scientific commented:

"Perlast perfluoroelastomer serves as a key component of our NanoPort Connections technology"

"PPE demonstrated it could manufacture the seals and ferrules to meet the very tight tolerances demanded by the Lab-on-a-Chip application and our precision-engineered NanoPorts. The chemical inertness of Perlast preserves the integrity of biological samples, which was also key to its selection. Equally important, PPE provided the seals and ferrules we needed in a time frame and at an R&D cost that no other company could achieve, greatly shortening the development time of our NanoPort product line."

A web of micro seals

Demand for micro elastomer seals measuring a few millimetres are growing within analytical and bio research equipment markets where purity, and ability to withstand a wide range of chemicals and temperatures, are the norm. PPE offers equipment manufacturers the opportunity to replace individual seals with a single web of multiple seals. The seal web makes equipment assembly quicker and ensures all seals are installed correctly.

