



ABOUT MINIFAB

MiniFAB offers contract product development, prototyping and manufacturing, specialising in customised solutions based on polymer micro and nano engineering.

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Nanotechnology at work

Nanotechnology is an emerging scientific field creating materials, devices, and systems at the molecular level. By being able to work at this ultra-small scale, nanotechnology is being used to deliver innovations in industries including clean energy, environment, health and personal care, electronics, transport, construction, telecommunications, manufacturing and mining.

Minifabrication using nanotechnology

Diagnoses of a broad range of medical and environmental issues requires a quick and effective collection of small amounts of a particular sample. The results must always be accurate, and moving parts of the diagnostic kit must be minimised to ensure successful transportation through all types of environments. This may seem like a big ask, but it is in fact the tiny science of nanotechnology that allows for such specific product development and manufacturing for the biotechnology sector.

MiniFAB Pty Ltd is an Australian success story in micro- and nanofabrication techniques for areas such as microfluidics assay development, biosensors and blood analysis. Much of MiniFAB's success is due to having the skilled staff to develop customised solutions using micro and nano engineering.

A particular example of this process is the development and manufacture of a disposable nanofluidic diagnostic tear sensor which is manufactured by MiniFAB in its ISO certified manufacturing facility in Melbourne, for a San Diego based client, TearLAB Corporation. The product is injection moulded and requires adherence to strict tolerances such that the system can reproducibly collect and analyse 50nL (nanolitres) of tear fluid for diagnosis of Dry Eye Disease.

Dry eye disease is a disorder that ranges in severity from mildly irritating to severely disabling, and affects millions of people world wide. This disorder of the tear film sees a loss of water leading to an increase in salt relative to water. It leaves people with a gritty feeling, and can have a number of severe side effects if not treated. However, its diagnosis has always been difficult, especially in the early stages of the disease. MiniFAB engineered a cheap, disposable nanofluidic device capable of collecting 50nL of tear fluid, without the use of active components such as pumps and valves. Internal gold electrodes were integrated to perform an electrical measurement on the tear sample. MiniFAB's nano engineering capability allowed for success where other device makers had failed.

By developing the nanofluidic tear sensor, MiniFAB has helped overcome the difficulty of diagnosing this disease using their expertise in nanotechnology.