

Detailed design of meso-scale manufacturing equipment.

The manufacturing sector in NZ has supported the growth of the country since the early days through the primary industries that helped build our infrastructure and reputation. More recently the country has become known as a seed hub for advanced technologies and innovative products and processes. This is seen through the global uptake of NZ products in the electronics, space and healthcare industries.

Within these sectors one area that has not been so well advanced is that of componentry used within many of these products. While manufacturing has grown it is mainly focussed on the macroscale while many of the high-tech sectors use componentry with very small dimensions and even microscale features. The conventional machining processes do not capable for small scale without much expense.

This project requires the design and manufacture of a small-scale injection unit suitable for the thermal processing of thermoplastic materials in volumes less than 4cm³. The basic concept is that the injection unit will have a heated jacket with temperature control and will operate manually.

A series of nozzles and simple mould tools will also be needed.

The project requires;

- a literature review to determine current technologies, design requirements and industry standards
- full design schedule including, costings, computer models and validation
- a complete set of mechanical drawings to enable fabrication of the unit
- fabrication and testing of the unit

Industry supervisor: Nil. This project supports future research at Wintec.

Research supervisor: Dr. Paul Ewart