



Trailblazer
Recycling &
Clean Energy

Turn ideas into technology with next generation prototyping equipment

The Advanced Prototyping Facility (APF) at the University of Newcastle is a central hub of cutting-edge tools for high-end prototyping for students, researchers and industry partners.

Located at the University of Newcastle's Callaghan campus near the College of Engineering, Science and Environment's Makerspace and the NIER precinct, the APF brings together machinery, multi-use facilities, and expert technical support to design, develop and manufacture new parts and technologies, while training the future workforce in these important skills.

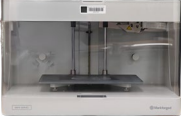


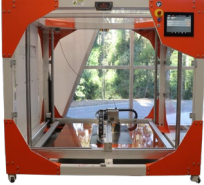
What capabilities are available?

Additive Manufacturing

3D Printing

The APF houses a diverse array of over 35 operational 3D printers, each utilising different technologies tailored to specific materials and applications. This extensive setup enables rapid turnaround times and supports a wide range of printing needs.

	Model	Process	Specifications	Available Materials
	Formlabs Fuse 1	Selective Laser Sintering (SLS)	Build volume: 165mm x 165mm x 300mm Layer height: 110 microns	Nylon 12
	Formlabs 3L	(SLA) Laser-powered	Build volume: 335mm x 200mm x 320mm Layer height: 0.025mm - 0.3mm	Clear Resin White Resin Rigid 10K Other materials available by request.
	Formlabs 3B+	(SLA) Laser-powered	Build volume: 145mm x 145mm x 193mm Layer height: 0.025mm - 0.3mm	Clear Resin White Resin Rigid 10K Compatible with Formlabs' entire SLA materials library, including biocompatible and sterilisable resins.
	Markforged X7	Fused Filament Fabrication, Continuous Filament Fabrication	Build volume: 330mm x 270mm x 200mm Layer height: 0.05mm, 0.1mm, 0.25mm	Plastics available: Onyx, Onyx FR, Onyx ESD, Nylon White, P-PLA, S-TPU
	Markforged Onyx Pro	Fused Filament Fabrication, Continuous Filament Fabrication	Build volume: 330mm x 270mm x 200mm Layer height: 0.1mm - 0.2mm	Plastics available: Onyx, P-PLA, S-TPU Fibres available: Fibreglass
	Raise Pro 3 Plus	Fused Filament Fabrication	Build volume: 300mm x 300mm x 605mm Layer height: 0.1mm - 0.3mm	Plastics available: PLA, PETG, ABS, TPU Dual Head

	Raise Pro 3	Fused Filament Fabrication	Build volume: 300mm x 300mm x 300mm Layer height: 0.1mm - 0.3mm	Plastics available: PLA, PETG, ABS, TPU Dual Head
	Raise E2	Fused Filament Fabrication	Build volume: 330mm x 330mm x 240mm Layer height: 0.1mm - 0.3mm	Plastics available: PLA, PETG, ABS, TPU Dual Head
	Big Rep One	Fused Filament Fabrication Large Format	Build volume: 1005mm x 1005mm x 1005mm Layer height: 0.1mm - 1.4mm	Materials available: PLA, PETG, PRO HT, TPU 98A

Subtractive Manufacturing

Waterjet Cutting

The APF is equipped with a waterjet cutting machine that utilises a high-pressure stream of water—up to 50,000 psi—combined with garnet abrasive to cut a wide range of materials, including steel, aluminium, plastics, rubber, stone, and glass. Unlike other cutting methods, this process does not generate heat, preserving the integrity of the material and preventing thermal distortion.

Model	Specifications
Techni Intec G2 i35 with PAC60 5-axis cutting head	Cutting area: 915mm x 1525mm Accuracy: 0.1mm +/-



Fibre Laser Cutting

The APF offers precise cutting services for thin sheet aluminium and stainless steel using a 1.5kW fibre laser machine. This advanced technology delivers fast, accurate results with minimal need for post-processing. Fibre laser cutting is a modern and highly efficient method that utilises a laser beam generated through fibre optic cables, ensuring clean edges and high-quality finishes across a range of materials.



Model	Specifications
Koenig LF1309 1.5kW Fibre Laser Cutter	Sheet size: 1300mm x 900mm Configured to cut aluminium up to 3mm and stainless steel to 1.6mm with high pressure compressed air supply.

Printed Circuit Board Manufacturing

The APF provides in-house Printed Circuit Board (PCB) manufacturing services, enabling rapid prototyping and production of custom electronic designs. This service supports quick turnaround times, precise quality control, and seamless integration with other prototyping capabilities, making it ideal for research, development, and small-scale production.

Laser Ablation

Laser ablation involves using a high-energy laser to vaporize or remove thin layers of material from the PCB surface without physical contact. This method is ideal for working with delicate substrates and achieving high-resolution patterns.



Model	Specifications
LKPF Protolaser U4	Maximum laser power: 5.7 W Laser pulse frequency: 25 – 300 kHz Diameter of focused laser beam: 20 ± 2 µm (0.78 ± 0.08 mil) Structuring speed: 5.5 cm²/min (0.9 in²/min) on laminated substrates with 18 µm (0.5 oz) Cu Minimum line/space: 50 µm/20 µm (2.0 mil/0.8 mil) on FR4 18 µm (0.5 oz) Cu

PCB Routing and Drilling

The PCB routing machine is a specialised tool used to mechanically shape and cut printed circuit boards (PCBs), especially for prototyping or small-scale production.



Model	Specifications
LKPF Protomat S64	Maximum layout area: 229 mm (X) x 305 mm (Y) x 8 mm (Z) (9” x 12” x 0.3”) Maximum material size: 250 mm (X) x 330 mm (Y) x 26 mm (Z) (9.8” x 13” x 1”) Mechanical resolution (X/Y): 0.5 µm (0.02 mil) Repeatability: ±5 µm (± 0.2 mil)

3D Scanners

The APF offers a selection of high-precision 3D scanners for short-term use, supporting advanced digital modelling and reverse engineering tasks. A variety of scanner models are available, each tailored to different use cases and capable of capturing detailed geometries across a wide range of materials and object sizes.

Model	Specifications
Academia 50	Accuracy: Up to 0.1mm Resolution: Up to 0.250mm
Go!SCAN 3D SPARK	Resolution: 0.100mm
HandySCAN BLACK / Elite	Accuracy: Up to 0.025mm Volumetric accuracy: Up to 0.020 + 0.040mm/m



Academia 50



Go!SCAN 3D SPARK



HandySCAN BLACK / Elite



Partner with us

TRaCE is looking to partner with trailblazing start-ups, scale-ups, and larger enterprises committed to accelerating the commercialisation of clean energy solutions to support the energy transition.

A suite of existing and new labs and workshops at the University of Newcastle and UNSW Sydney are equipped with a range of the latest manufacturing and prototyping equipment to help you take your technologies to market.

By partnering with TRaCE, you can also gain access to specialist advice, research and project management support, and matched funding.

Trailblazer for Recycling and Clean Energy (TRaCE)

The TRaCE program is supported by the Australian Government Department of Education through the Trailblazer Universities Program.

A collaborative partnership between



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Connect with us

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For more information about TRaCE, contact hello@trace.org.au or visit www.trace.org.au.



Techni Intec G2 i35 with
PAC60 5-axis cutting head