

OVERVIEW

The main aim of the Technology Station is to provide companies in the manufacturing sector with subsidised assistance in product and tooling design, development and manufacture. The objective is to ultimately assist these companies to become more competitive via technology transfer.

Some of the services offered include:

- Prototype manufacture
- Limited run (small scale) production
- Process development
- Tooling design and manufacture
- Research and development
- Product design and structural analysis
- Material property testing

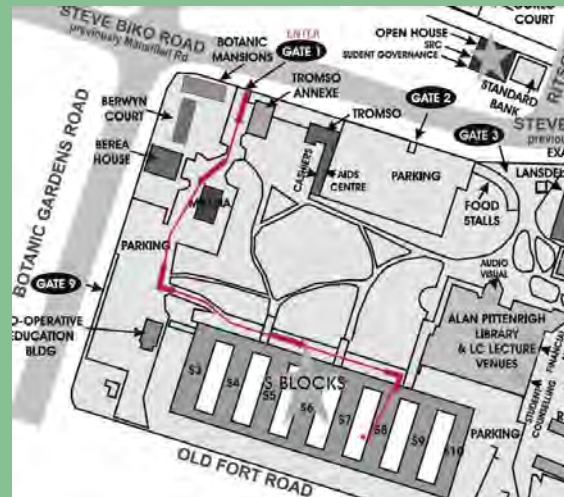
Within the Technology Station there are three operating units: The Prototyping unit, Design unit and Advanced manufacturing unit

CONTACT US

Testing and prototyping: Ebrahim Cassim
 ebrahmc@dut.ac.za
 Tel: +27 (0) 31 373 2995/6836
 Cel: 083 321 7283

Design: Ryan Hamilton
 ryanh@dut.ac.za
 Tel: +27 (0) 31 373 2543
 Cel: 083 787 7926

Advanced manufacturing: Brett Clarke
 brettc@dut.ac.za
 Tel: +27 (0) 31 373 2858
 Cel: 082 780 8915



PROTOTYPING UNIT

The TS Prototyping Unit specialises in the fabrication of tooling and prototyping for the composites sector. Composite materials such as glass fibre, carbon fibre, aramids and other high performance materials are utilised.

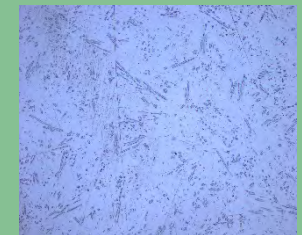
The unit offers CNC machining services to our clients, from general profiles/shapes to intricate 3d models. All are machined to tight tolerances.



3D CNC Router machining part of a plug for the Hino300 grille (left) and final product (right).

The Prototyping Unit also offers a broad range of mechanical testing services. Such tests include:

- Tensile strength,
- Shear strength.
- Flexural strength.
- Barcol Hardness,
- Mass fraction,
- Optical microscopy,
- Scanning electron microscopy,
- Degree of polymerisation,
- Differential scanning calorimetry,
- Dynamic mechanical analysis,
- Chemical analysis.

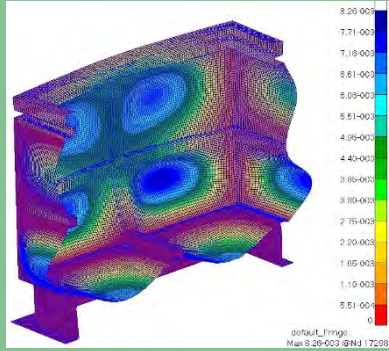


High resolution Microscope image (100x magnification) of metal sample

Lloyd LR32k Universal tensile testing machine

DESIGN UNIT

The Design Unit specializes in conceptual design and design verification of fabrications and systems and makes use of some of the most sophisticated design analysis software and techniques (like finite element analysis – FEA) available. The highly qualified personnel are experts in the field of 3D modeling, design, design optimization and verification.



Finite Element Analysis to determine the structural laminate for a composite planter box for G7 Technologies. The plot shows the maximum deflection at 8.26mm.

The Unit's Stratasys 250MC 3D printer brings concept to life, as it allows the client to physically experience their design concept.



3D print of motor housing using a Stratasys 250MC.

ADVANCED MANUFACTURING UNIT

The Advanced Manufacturing Unit specializes in tooling design, development and manufacture. The Laboratory is a well-equipped CNC machining centre whose staff are experts in plastic injection mould design and manufacture. The Advanced Manufacturing Unit boasts the following facilities:

- Computer Aided Design & Machining [CAD / CAM]
- 3 & 5 axis CNC milling
- CNC Turning
- Electrical Discharge Machining [EDM]
- Surface Grinding
- Coordinate Measuring Machine
- Shadow Graph
- Hand Measuring Tools and Granite Tables



Specimen testing jig machined from stainless steel.



Co-ordinate Measuring Machine (CMM) accurately measures components for reverse engineering



A component machined by 5-axis

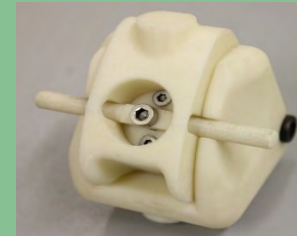


Machining

SUCCESS STORIES



The University of KwaZulu Natal students represented South Africa for the first time ever in the Bridgestone World Solar Car Challenge. It was a 3000 km journey across the Australian Outback. The shell was manufactured by the Technology station using carbon fiber by vacuum bagging process.



With the 3d printer, 2 Prosthetic knee design concepts were grown to determine their viability before final design and prototyping. It was immediately evident where potential downfalls could appear from both function and a manufacturing point of view.



Automatic static and fatigue loading test rig for loading train seats manufactured for a client. The success of the rig won the client a major contract to manufacture and test the seats in South Africa.

