Advanced Design and Prototyping Technologies Institute (ADaPT)

The ADaPT Institute collaborates with industry and research partners to address engineering and design challenges by delivering end-to-end digital solutions from advanced custom design to manufacture, drawing upon our wide-ranging academic expertise and cutting-edge equipment for advanced manufacturing, 3D modelling and simulation, and product performance validation.

Capabilities

Metal 3D Printing

Renishaw AM400
SLM (Selective Laser Melting)
Build volume: 250 x 250 x 300 mm³
Laser: 400 W pulsed fibre laser, Ø 70 µm
Layer thickness: 30 & 60 µm

Materials available at ADaPT:
Titanium (Ti6Al4V)
Aluminum (AlSi10Mg)
Inconel (In718)

Polymer 3D Printing

Formlabs Form 3BL
LFS (Low Force Stereolithography)
Build volume: 335 x 200 x 300 mm³
Laser: 250 mW (x2), Ø 85 µm
Layer thickness: 50 & 100 µm

Materials available at ADaPT:
Flexible 80A
Elastic 50A
Clear (Rigid)

Formlabs Fuse 1+ 30W
SLS (Selective Laser Sintering)
Build volume: 165 x 165 x 300 mm³
Laser: 30 W Ytterbium Fiber, Ø 200 µm
Layer thickness: 110 µm

Materials available at ADaPT:
Biocompatible nylon 12

3D Systems Figure 4 Standalone
DLP (Digital Light Processing)
Build volume: 124.8 x 70.2 x 196 mm³
Laser: 405 nm DLP module
Layer thickness: 10, 30 & 50 µm

Materials available at ADaPT:
Rubber-65A BLK
Rubber-BLK 10
Pro-BLK-10

Markforged Mark Two
FFF (Fused Filament Fabrication)
Build volume: 320 x 132 x 154 mm³
Extrusion System: Dual Nozzle
Layer thickness: 100 & 200 µm

Materials available at ADaPT:
Onyx (Nylon 6)
Precise PLA
Smooth TPU 95A
Carbon fibre
Fibreglass
Kevlar

Composite Manufacturing

Luyten 3D Concrete Printer
FDM (Fused Deposition Manufacturing)
Build Volume: 1000 mm x ∞ x 1000 mm
Extrusion System:
Tursiops extrusion mechanism
Layer thickness: up to 40 mm

Etamax Composite Filament Winder
6mm carbon fibre ribbon
Build Volume: 400 mm Ø x 1.6 m

Materials available at ADaPT:
Prepreg
Towpreg

Post processing

Nabertherm N 41/H Furnace
Temperature range: 100-1280 °C
Optional Argon Atmosphere
Chamber Dimensions: 350 x 500 x 250 mm³

Makino U3
WEDM (Wire Electrical Discharge Machining)
Chamber Dimensions: 370 x 270 x 220 mm³

Other post processing:
Sand blasting, CNC milling, CNC lathe, water jet cutting, grinding

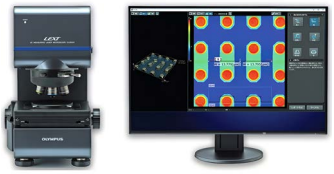
Analysis

Hexagon Absolute Arm
CMM (Coordinate Measurement Machine)
Laser scanner (RS5 scanner)
Probing accuracy: 6 µm
Laser scanning accuracy: 43 µm

Instron ElectroPuls E20000
Tension-Torsion Fatigue Tester
Bio-material compatible testing in bio-bath
Tension / Compression Capacity: 20 kN
Torsion Capacity: 130 Nm
High-Frequency Dynamic Testing (100Hz)

Thermal Conductivity Analyser
MTPS (Modified Transient Plane Source)
TLS Needle (Transient Line Source)
Flex TPS (Transient Plane Source)
Thermal conductivity range: 0-2000 W/mK

LEXT OLS5100
3D Laser Scanning Microscope
Resolution: 10 nm
Lens Range: 5x, 10x, 20x, 50x, 50x long range



Other analysis:
Advanced characterisation tools such as SEM (Scanning Electron Microscopy)

Software

Autodesk Fusion 360
SolidWorks Premium CAD
Polyworks Inspector
Abaqus Simulia

Altair Hyperworks
MATLAB Premium
OriginPro

Materialise Suite:
Magics
3-Matic
Mimics

Note: The equipment and materials listed are the featured brands we are using.
Other 3D printing materials are available upon request.

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