

Facilities at Heriot-Watt University

Heriot-Watt University offers an impressive range of laboratories, workshops and specialised equipment which can be accessed by companies for their own use.

This might be for experimental work, testing prototypes, data analysis or training purposes. These facilities are supported by well trained technicians and specialist members of staff who can assist you with the equipment and help you to interpret the results.

Whatever your business requirement, we can work with you to provide the most appropriate facilities to meet your business needs.

BIOLOGICAL ANALYSIS

- **Mass Spectrometry**
 - Ettan Probe MALDI-ToF Mass Spectrometer
 - Bench Top Mass Spectrometer
- **Microscopy Equipment**
 - Zeiss Axiophot Microscope (with Phase Contrast, Differential Interference Contrast, Bright Field, Fluorescence, Digital Image Capture And Image Analysis, Confocal Scanning Microscope)
- **Analytical Equipment**
 - High Performance Liquid Chromatography
 - Fast Protein Liquid Chromatography
 - Gas Chromatography
 - GC/MS
 - Elemental Analyser
- **Molecular Biology Equipment**
 - Biorad PCR Machine
 - Quantitative (Real Time) PCR
- **Protein Chemistry Equipment**
 - Aktapurifier Protein Purification Platform
 - Gel Electrophoresis Equipment
 - Preparative Ultracentrifuge

BUILT ENVIRONMENT ANALYSIS

- **Acoustics Lab**
- **Concrete Lab**
- **Hydraulics Lab**
- **Geotechniques Lab**
- **Structures Lab**
- **Pipe Line Technical Centre**

- **Rail Track test Centre**
- **Fatigue Testing Facility**
- **Rotating House**
- **Wave Basin**
- **Wind Tunnel**
- **Anechoic Chamber**
- **Reverberant Chamber**
- **Horizontal Transmission Suite**
- **Vertical Transmission Suite**
- **Materials Testing Lab**
- **Materials Research Lab**
- **Wet Lab**
- **Concrete Materials Test Lab**
- **Buildings Testing Lab**
- **Drainage**
- **Thermal Studies**

CHEMICAL ENGINEERING

- **250 Litre pilot reactor for scale up studies**
- **In-line Particle sizers**
- **Rheometers**
- **Separation tanks**
- **Oscillating column (4m height, 1m diameter)**
- **Oscillated Baffled Reactors**

ELECTRONIC MATERIALS CHARACTERISATION

- **Raman spectrometer**
- **Capacitance-voltage (C-V) measuring system**
- **Minority carrier lifetime flash tester**
- **4-point probe**
- **SEM**
- **AFM**



FINE CHEMICALS SYNTHESIS

- Expert synthesis of organic, inorganic, organometallic and polymeric chemicals to your specification

HIGH-VOLTAGE FACILITIES

- Lightning and switching surges 800kV
- DC insulation and breakdown tests 300kV
- AC testing 300 kV
- Partial discharge detector 20kV
- 50kV, 40mA switch-mode supply

MATERIALS ANALYSIS

- NMR Spectroscopy
 - ¹H, ¹³C, ¹⁹F & ³¹P to ¹⁰⁹Ag
- Single Crystal X-ray Diffractometry
- Mass Spectrometry
- Elemental Analysis (CHN)
- Other Analytical Methods
 - FTIR
 - UV/Visible spectroscopy
 - GC/HPLC
 - CCD Camera
 - DSC & DMTA
 - Thermogravimetric analysis
 - Gas Chromatography
- Atomic Force Microscopy
- Light Microscopy with Image Analysis
- Molecular Modelling
- Particle Size Analysis
- CHN Micro Analysis
- High Temperature Furnaces
- Micromechanics
 - Focused ion beam scanning electron microscope
 - Nano-Mechanical Testing
 - Nano hardness, scratch and wear
 - Raman Spectroscopy
 - Mechanical Testers
 - Hardness
- Tensile
- Charpy Impact
- Wearing Rigs
- Rolling Wear
- Abrasive Wear
- Sliding Wear
- Micrographic
- Interferometer
- DEKTAK

METROLOGY

- CMM Metrology
- Cartesian 3 axis scanning
- Manual Metrology Scanning

MICROFABRICATION FACILITIES

- Photolithography
- Class 1000 clean room
- Mask aligner
- UV exposure system
- 3 Spin coaters, 4", 8" & 16"
- Photometer
- Ultra Pure water processor
- Deposition
- e-beam evaporator
- Nickel DC plating system
- Nickel Pulse plating system
- Process
- Flip chip bonder
- Hot plates (100 & 200mm)
- Ultrasonic bath
- Die bonder
- Wire bonder
- DEC Horizon Stencil Printer

- Epilog 40W laser Cutting System
- Inspection
- Scanning electron microscope
- Optical stereo microscope
- White light interferometer
- Probe Station
- Low Temperature Co-fired Ceramic (LTCC) fabrication
- KEKO LTCC Stacker
- KEKO LTCC Isostatic Press

MICROWAVE FACILITIES

- Anechoic chamber with Near field scanner
- Superconductor Chamber
- Microwave Network Analysers

OPTICAL DIAGNOSTICS FOR ENGINEERING COMPONENTS

- Shape measurement
- Deformation and strain measurement
- Vibration measurement and modal analysis
- Fluid flow measurement

OPTICAL FACILITIES

- The Micro-Fabrication Lab
 - Edwards Evaporator
 - Wafer Dicing Saw
 - Scanning electron Microscope
 - Reactive Ion Etcher
 - Photolithography suite
- The Optical Polishing Lab
 - Disc lapping and polishing Machines
 - Interferometer
 - Diamond Wheel Cutting Saw
 - Associated measuring equipment
- Optics Vacuum Deposition/Coating Lab
 - Leybold-Heraus optical coating plant
 - Optical coating design software
- Lasers & Optical Devices
 - CO₂ Lasers
 - Laser precision machining
 - Laser micro machining
 - Argon ion Lasers
 - Nd YAG
 - Other Solid State Lasers

RAPID PROTOTYPING

- 3D printer
- Zprinter 310 for rapid prototyping
- Milling Machine

SOLAR CELLS

- Module Fabrication Equipment
 - PECVD thin-film deposition
 - EETS PV module laminator
 - PMMA casting
 - Thermal polymerisation
 - UV polymerisation
 - Cutting and polishing
 - EVA dyeing
 - Curing & degassing
- Characterisation
 - Small area solar simulator (20cm x 20cm - class A) and current-voltage (I-V) measurement system
 - Large area solar simulator (1m x 1m - class B) and I-V measurement system
 - Spectral response (EQE, IQE)
- Testing
 - Environmental test chambers – incl. in-situ optical and electrical measurements
 - Outdoor Renewable Energy Test Site by 2010 (fixed + tracking PV, full datalogging)

TEXTILES AND DESIGN

- Textile Printing
- Yarn Production
 - (Fancy, Short Staple, Worsted & Filament)
- Textile Colouration and Dyeing
- Textile Finishing
 - (Star Steamer, Autoclave & Flat Bed Press)
- Textile Evaluation and Testing
 - Fabrics
 - Fibres
 - Yarns
 - Colour Fastness
 - Flammability
 - Image Analysis
- Clothing Production
 - Lectra System
 - General Sewing Data Network
 - Sewing and Garment production machines
- Colour Measurement
 - Hunterlab Colourimeter
 - ICS MM 8000 system
 - SCOT colour system
- Chemical and Materials Analysis
 - Gas Chromatographs
 - Thermal Analysis Equipment
 - DSC
 - HPLC
 - Fluorescence Spectrometer
 - FTIR
 - UV/VIS
 - Freeze Drier
 - Gas absorption apparatus
 - Instron and Nene Tensile Testers
- Computer Aided Design (CAD) Lab

VIRTUAL REALITY FACILITIES

- SGI Onyx4 Visualisation system
- Intersence ultrasonic motion tracking system with 3D projector
- Eye trackers
- Haptic Interfaces
- Measurement of physical response to VR (facial response, skin conductance and brain activity)

WORKSHOP FACILITIES

- Machining – CNC Milling
 - Wadkin V5 10 Vertical CNC Machiningcentre capacity (100x500x500mm) Takang Vertical CNC Mill capacity (100x500x500mm)
- Machining – CNC Turning
 - Mori-Seiki SI-25Y CNC Lathe with Fanuc 18TC control. Maximum Diameter 250mm, Maximum length 530mm
- Machining – CNC Laser Cutting
 - Trumpf TLF2700T Co2 Laser
 - CAD/CAM
 - AutoCAD
 - PEPS
 - CNC Solid Solid edge
 - Edgecam

OTHER FACILITIES

- Aquarium Facilities
- Facilities for Growing and Analysing Bacteria
- Brewery
 - 20HI Pilot Brewery