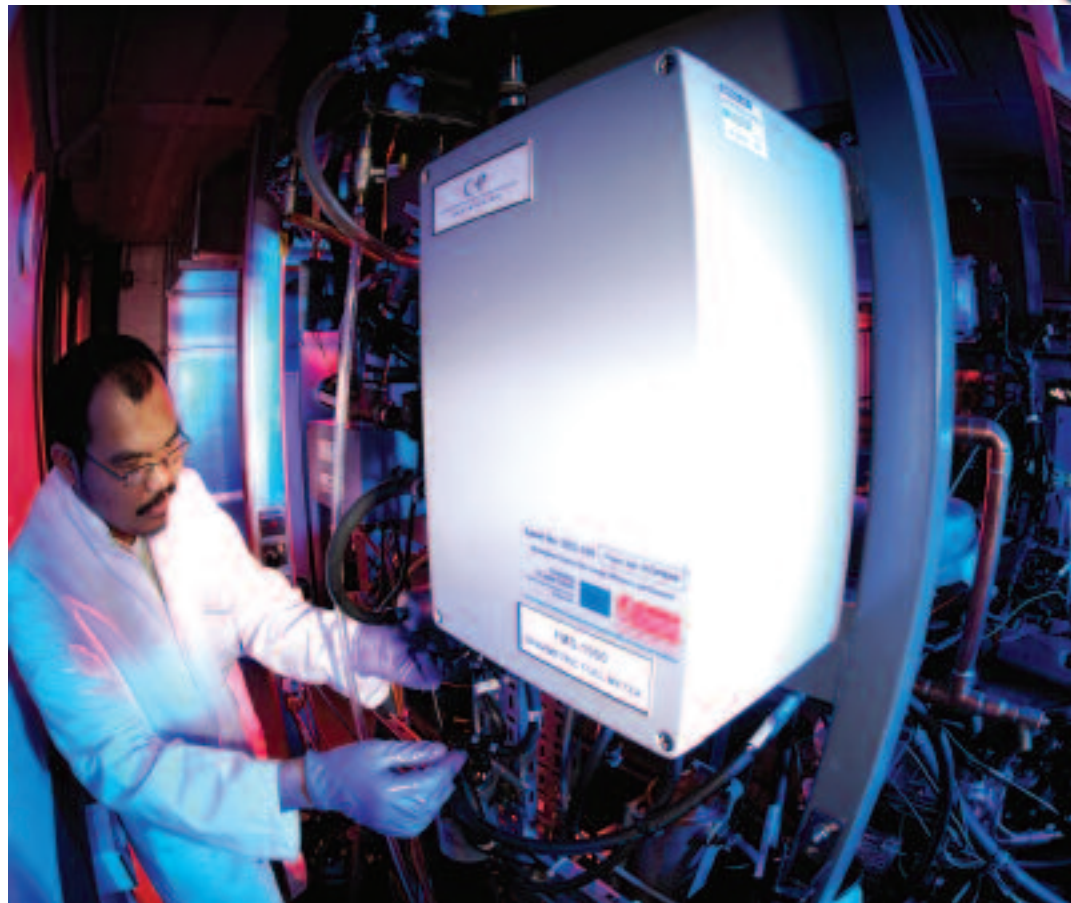


SCIENCE CITY RESEARCH ALLIANCE

UNIVERSITY OF
BIRMINGHAM

THE UNIVERSITY OF
WARWICK



FUTURE ENGINES AND FUELS RESEARCH

Fuel Pre-Treatment and Exhaust After-Treatment

New state-of-the-art equipment for fuel pre-treatment and exhaust after-treatment research activities includes sophisticated instrumentation for exhaust gas diagnostics. The instrumentation, based at University of Birmingham, can identify and measure the composition of exhaust gases including particulate emissions, individual hydrocarbons and nitrogen oxides in transient and static tests.

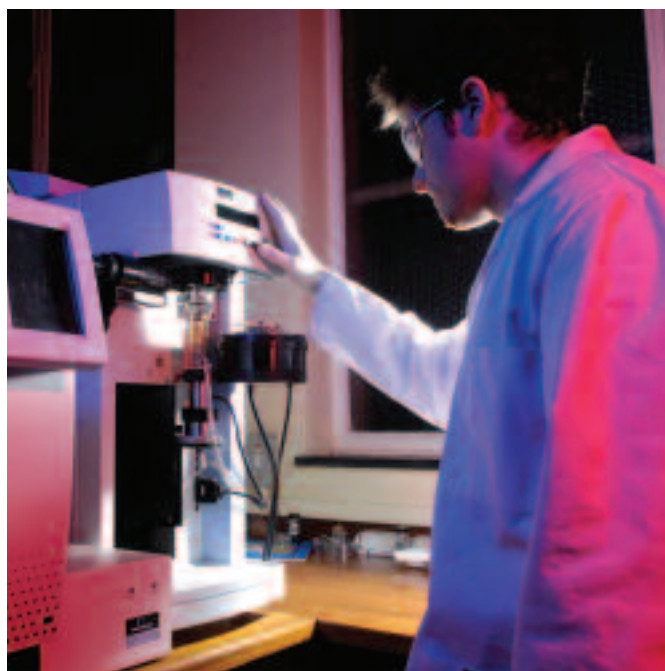
COMPOSITION CHARACTERISATION AND ANALYSIS:

- A computer-controlled thermo-gravimetric analyser - TGA Perkin Elmer Pyris 1 – is available for the analysis of organic materials produced from the combustion of fuels in internal combustion engines. It can be used for particulate matter characterisation from the combustion of different fuels or the coke formed over catalysts.
- An advanced Perkin Elmer Clarus 600T GC Mass Spectrometer system can be used for the speciation of engine vehicle exhaust (gas samples) and engine fuel analysis (liquid samples). It can be directly linked to the TGA system permitting speciation of gases eluting from the TGA.

EMISSIONS MEASUREMENT AND ANALYSIS:

- Fast response flame ionisation detector (FID) - Combustion Fast FID HFR500 - can monitor total hydrocarbons in the engine exhaust gas or in the engine cylinder.
- Fast response NO_x analyser - Combustion Fast NO_x - can monitor NO_x over the catalyst or inside the engine combustion chamber and can be used for applications where a standard NO_x analyser is not applicable.
- Fourier transform infrared (FT-IR) gas analyser - 2030HS on-line high speed - can be used for the analysis of the gaseous organic (e.g. hydrocarbons speciation) and inorganic (e.g. NO_x) compounds of the catalytic treated and untreated engine exhaust gas.
- Real time particulate matter analyser - HORIBA MEXA-1230PM (soot, SOF, total PM) - can make real-time measurements of particulate matter. It measures either tunnel-diluted or direct raw exhaust. It can display measured values of target components, soot, SOF and T-PM, in mg/m³ by conversion coefficients. The system is a mobile unit and can be connected to several test cells via heated sampling lines.

This equipment supplements an extensive range of existing experimental facilities that are specifically, but not exclusively geared for fuel reforming experiments. Research, development and applications of on-board fuel reforming are one of the main areas of activity and expertise in The Future Engines and Fuels Laboratory.



For further information and enquiries, including proposals for research collaboration and consultancy:

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investing
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European Regional Development Fund
European Union



These new research facilities are part of the Science City Energy Efficiency and Demand project funded by Advantage West Midlands and the European Regional Development Fund. The project is part of a wider investment in research infrastructure of the West Midlands region, which unites the Universities of Birmingham and Warwick in the newly-formed Science City Research Alliance.