



AUTOMOTIVE

Industrial research using Diamond

The eternal dream to explore matter at its deepest level has continually driven scientists to build more and more powerful instruments from simple microscopes to elaborate X-ray sources.

Diamond Light Source is a sophisticated synchrotron light facility which can generate highly intense beams of light ranging from IR and UV to

X-rays, all of which are making research at the cutting edge of modern science possible. Diamond provides specialist analytical techniques for the atomic to microscale characterisation of materials as diverse as novel pharmaceuticals, catalytic materials, coatings, motor oils, and large engineering components.

Our dedicated Industrial Liaison Team of highly skilled

scientists is available to support you in every step of your research. The team can help to translate your R&D challenges into meaningful analytical solutions by making use of its diverse expertise in synchrotron methods.

Some examples of how Diamond can be used for automotive research are outlined overleaf.



Applications

Catalysts

- Element selective investigation of a wide range of materials, crystalline or amorphous, and at very low concentration;
- Structural and electronic studies of homogeneous and heterogeneous catalysts in operating conditions;
- Follow chemical composition changes during corrosion.

Coatings

- Investigate surface and layer structure and ordering in paints and performance coatings;
- Characterise the nanostructure of non-crystalline materials under controlled environmental conditions: e.g. polymers, composites, alloys and ceramics;
- Investigate the performance of corrosion resistant coatings.

Materials structure

- Investigate materials manufacture and processing problems;
- Characterisation of materials with respect to the evolution of microstructure, crystallographic transformation and residual stress;
- Uncover cracks and voids, in static conditions or during *in situ* loading.

Fuels & lubricants

- Investigate fuel cells and hydrogen storage materials;
- Explore phase behaviour in fuels, motor oils and lubricants in the presence of additives;
- Understand interfacial phenomena relating to friction, lubrication and wear.

SF-AUT-002-2



For further information

Diamond Industrial Liaison Team

 +44 1235 778797

 industry@diamond.ac.uk

 diamond.ac.uk/industry

 @DiamondILO