

NEWSLETTER

LPD Lab Services

TEL: +44 (0)1254 676 074

One-Stop Shop for Industrial Process Problem Solving, Consulting and Routine Analysis

Welcome to the Spring edition of LPD Lab Services newsletter. LPD have continued building on their success in 2017 and have been extending services and industrial capabilities. LPD's technical delivery and client reputation for solving problems continues to grow and resulted in further investment in technical expertise and equipment capability. This has involved recruiting a Senior Scientist, Dr Kim Nickson and also the purchase of a new tensile testing instrument.

Dr Kim Nickson – Senior Scientist – Electron Microscopy and Chemistry

After completing a degree in Forensic Science with Criminology at University of Central Lancashire, Kim completed a PhD in materials chemistry.

The PhD involved creating a novel nanocomposite with photocatalytic semiconductor properties. The nanocomposite was then used to perform photo-redox reactions to simultaneously oxidise and reduce pollutants in contaminated water courses. Kim worked as a postdoctoral researcher for a number of years on a wide variety of projects, before becoming the lead scientist for a small company working in the field of electrochemical capacitor optimisation. As part of a UCLAN centralised analytical facility, she was responsible for conducting work using a diverse range of techniques: including potentiometry, cyclic and capacitance voltammetry, as well as a range of wet chemical techniques such as Karl Fischer titrations. Kim joined LPD Lab Services in January of this year and is principally involved in conducting surface analysis investigations, SEM/EDX, optical microscopy and image analysis as well as contact angle measurements. Kim is also involved in using and interpreting a range of other techniques including electrochemistry, GC-MS, HPLC, UV-Vis and wet chemistry techniques.



Successful Renewal of UKAS ISO/IEC17025:2005 Accreditation

LPD Lab Services was recently visited by UKAS in January 2018 for its 4 yearly reassessment external audit of its ISO/IEC17025:2005 accreditation. This reassessment was successful and for the next 3 years UKAS will conduct annual surveillance audits to supplement the company's annual cycle of internal quality auditing.

Accredited tests evaluated in the recent audit included anion testing by Dionex Ion Chromatography instrumentation. The auditors once again recognised the continuous improvements made by LPD Lab Services' quality system lead by Mike Ellicott, the company's Quality Manager. The audit confirmed that the laboratory had effective control of its quality system and continues to achieve good performance in terms of quality control. This external recognition builds on the feedback received from clients ensuring the quality of analysis and valued interventions are within industry recognised standards. Indeed, recent business development activities have continued to highlight the high regard clients hold for LPD, its staff and insightful consultancy services.

There is also a big push from Mike to develop and invest in the quality system further and LPD Lab Services have committed to being certified to ISO17025:2017 within the next 3 years.

Metals can, however, be attacked by aqueous based corrosion or oxidised at elevated temperatures. So what is Corrosion? It is essentially an electrochemical process which involves the exchange of



electrons from the metal to other species in its environment. This flow of electrons is the same as electric current. If it is possible to measure the corrosion current, then the corrosion rate can be determined. LPD Lab Services have the capability in house to determine the corrosion rate and linked with SEM/EDX, Surface Analysis like XPS and FTIR the mechanism and interacting factors can be determined.

Corrosion and Failure – Should You Be Concerned?

LPD Lab Services have extended capabilities and capacity to deliver metal corrosion failure investigations and consultancy with Dr Justyna Anwar and senior metallurgist Danie Els.

Often corrosion and degradation is directly due to the aggressive environment that a product is exposed to over its operational life. In the case of plastics or paint coatings degradation, oxidation or poor curing can result in embrittlement of discolouration, paint delamination or solvent swelling.



Corrosion takes many forms, including: stress, cracking, pitting, uniform, underfilm or galvanic, and can appear in unexpected places. LPD have extensive experience to understand corrosion and determine the corrosion rate.

LPD Lab Services have a combination of optical and scanning electron microscopy (SEM) with EDX elemental analysis and surface analysis, such as XPS and SIMS, Ion Chromatography, pH and Conductivity that provide both a deep analytical understanding of the problem and identify causes.

Once the corrosion mechanism is understood, advice can be given to the customer on possible preventive measures and product enhancements to reduce or eliminate impact.

New equipment at LPD – Testometric M500-50CT Mechanical Test Machine

The laboratory has had a tensile testing instrument for many years but this had limited load cell capability. Through the investment and purchase of Testometric M500-50CT this now extends the load cell capability offered by LPD Lab Services up to a maximum load of 50kN. It adds additional capability with lower load cells of 2.5kN and 50N, thus allowing for a much smaller and delicate measurement to be made with bespoke tooling.

During mechanical testing of a specimen of a material or component they will be subjected to a mechanical force, to either:-

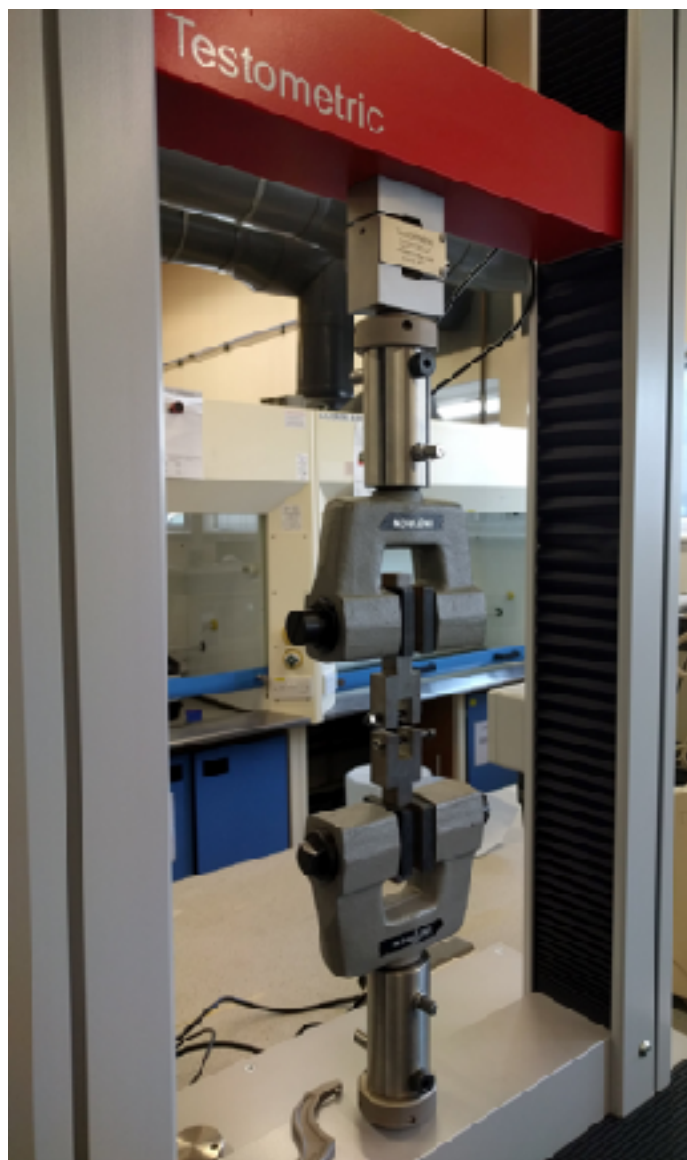
- Tensile or pulling
- Compressive or crushing
- Bending or flexing
- Torsion or twisting
- Frictional and dragging
- Peel resistance
- Programme cycles of load and unload - Tension or compression.

The Testometric M500-50CT testing machine automatically measures the forces applied and the resulting behaviour of the material. Mechanical properties can be derived from the Load / Displacement or Stress / Strain curves:-

- Yield Strength / Yield Point (YS)
- Ultimate Tensile Strength (UTS)
- Youngs Modulus for elasticity
- Modulus of Toughness - Brittleness
- Elongation and reduction in area – Ductility.

Mechanical testing is typically applied to:

- Plastics
- Rubbers
- Metals
- Engineering Ceramics
- Composite Materials (fibre glass or carbon fibre reinforced plastics)
- Parts, components tubes and wires
- Friction measurements.



LPD Lab Services – The full problem solving suite?

To understand more about our full and expanding technical services and analytical testing capabilities please visit our website www.lpdlabservices.co.uk, alternatively you could call us on 01254 676074 and discuss the problem / technique or you could arrange to meet the team and see the laboratory located in Blackburn, Lancashire.