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 Winter edition of LPD Lab Services newsletter. LPD have continued building on their success in 2017. The company's stability and profitability continue to grow steadily allowing further investment in technical expertise, equipment capability and service delivery. This has involved recruiting a senior organic chemist, Angus Montgomery and also the purchase of a new Atomic Absorption Spectrophotometry (AAS) instrument.

Introducing Angus Montgomery – Senior Organic Chemist

In May 2017, Angus Montgomery joined the company as a Senior Organic Chemist. He brings 40 years of experience and his main responsibilities are chemical determination, failure analysis investigations, classical chemical analysis, FTIR, method development, duplication of standards, method validation and identification of chemicals and materials.
Angus studied analytical chemistry and obtained an B.Sc. from Lancaster University. He spent most of his career working in agrochemicals and pharmaceuticals, although has spent time working in electrochemistry, plastics, teaching chemistry and brewing.

Angus is an organic chemist understanding chemical reactions and interactions as well as being versatile and expert on analytical instrumentation including HPLC, UV-Vis assays, GC, GC-HS, LC-MS and FTIR. He has experience of method development, validation (ICH) and raw materials has supported product development, pilot and volume manufacturing and process research. This wealth of experience builds on the extensive capabilities of the growing LPD Lab Services staff and consultants.

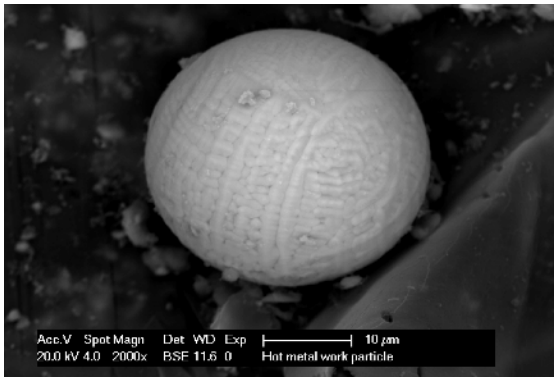
Metallurgy Testing Services

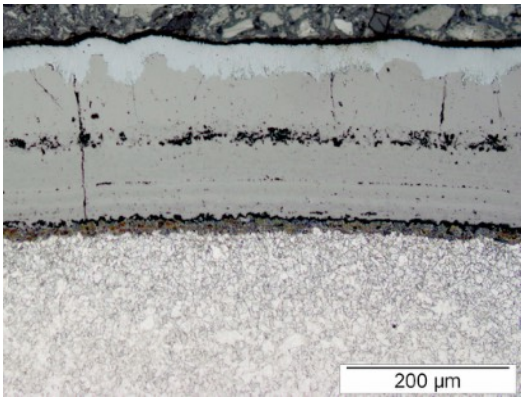
Metallurgy is a term that includes a wide range of practices related to the extraction of metals from their ores, refining the crude metals, producing alloys, their shaping and the manipulation of their properties. Metallography is a branch of metallurgy that is concerned with the examination and characterisation of the structure of metals and alloys.

At LPD Lab Services analysis, interpretation and consultancy of the metals data is carried out or overseen by the Senior Metallurgist, Danie Els and this activity has grown consistently since Danie joined the company with the insight he brings from 24 years in industry and test houses.

The mechanical properties of alloys are determined by both the chemical composition and the microstructure backed up by mechanical testing and hardness measurements. Metallography aims to identify microstructural phases, estimating the volume fraction of each phase, assessing the grain size, and discovering defects or irregularities.

To assess the microstructure of an alloy, a cross-section is systematically prepared by rough grinding, fine grinding, polishing and etching. Mounting in a resin is used for the preparation of small sections. A non-destructive approach can be adopted by replicating the surface microstructure using acetate sheet or a bespoke medium. Examination is performed using light microscopy or scanning electron microscopes SEM/EDX.





Fractography is the study of characteristic features on fracture surfaces to determine the nature of the fracture and to identify the fracture initiation point. It is applied to metals and non-metallic materials.

Fractographic analysis is the first step in analysing the root cause of a failure. It begins with visual examination, followed by low power magnification (typically using a binocular microscope). SEM can also be applied to aid fractography at a finer scale and characterise flaws like stress concentrators, inclusions or porosity. EDX in the SEM allows the composition of any inclusions to be determined at initiation sites for example.

LPD Lab Services applies metallographic and fractography along with other advanced analytical techniques such as 3D X-ray imaging to assist in failure and root cause analysis as well as product and process development.

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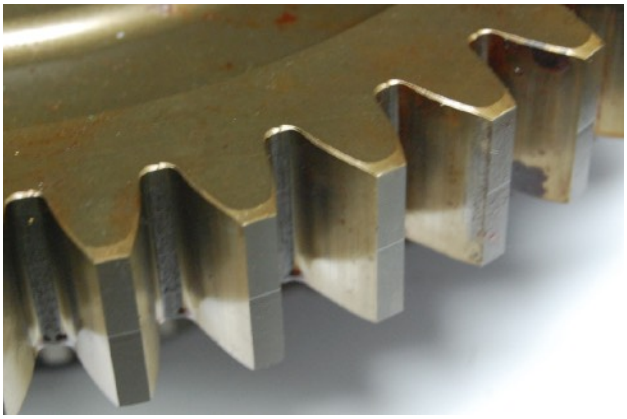
Typical Applications of Metallurgy:

- ✦Engine component failure analysis.
- ✦Corrosion investigations and high temperature oxidation of metals.
- ✦Bearing failure investigation.
- ✦Weld failure investigation, weld inclusions and determination of size of Heat Affected Zone HAZ.
- ✦Checking appropriate alloy grades and heat treatments have been applied to achieve desired surface and bulk properties.
- ✦Assess cleaning and degreasing of metals with surface analysis techniques like XPS.
- ✦Powder metallurgy and failure investigations including sintering and green cracking problems.
- ✦Anodising of aluminium alloys and castings for painting or adhesive bonding.
- ✦Hardness and friction and wear problem solving.
- ✦Alloy and metal component analysis.



New equipment at LPD - Agilent 55b Atomic Absorption Spectrometer

The laboratory has had 2 AAS instruments for many years for quantitative analysis of elements in liquids and chemically digested materials, but to improve sensitivity and reliability a new Agilent 55b instrument was bought over the summer.

Subsequently the lab's UKAS accredited tests have all been validated and released.

Typical Applications of AAS (Atomic Absorbance Spectrophotometry)

- ✦Quantitative metal concentrations in solutions.
- ✦Monitoring of trace metals in industrial effluent streams.
- ✦Trace elements in product / raw materials coupled with the laboratory's ICP-MS.
- ✦Analysis of additives and purity in steels and other metal alloys.
- ✦Analysis of low level contaminants.

REACH Data Deadline – 1st June 2018

The REACH Registration 2018 represents the final deadline for the registration of phase-in substances. The deadline and by 1 June 2018, any substance that has been pre-registered must be registered if manufacture or import is to continue in quantities of 1 tonne per annum (tpa) or more. LPD offer support to the REACH regulations. Please contact us for a discussion and support.