

NEWSLETTER

LPD Lab Services

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

Welcome to our fifth newsletter. We send this quarterly as a means of keeping our customers up to date with some of our capabilities, services and news at LPD Lab Services. If you have colleagues who you think may be interested in hearing from us please feel free to forward this on to any interested parties.

Chemical, Electrochemical, Physical, Thermal & Electrical Discharge Surface Treatments

LPD Lab Services frequently solve customer's problems in chemical etching, surface preparation and electrochemical surface coating, sputtering and electrical discharge processes. A combination of surface analytical techniques such as XPS, SIMS and AES and chemical analytical techniques such as FTIR, AAS and XRF are used to investigate surface quality. Physical microscopic examination is carried out by optical microscopy and scanning electron microscopy (SEM/EDX).



Treatment processes are employed in manufacturing for a whole variety of reasons. How these treatment processes perform and their stability in-process as well as the resultant surface treatment can be critical for function, operation life and even in terms of downstream process interactions:

Example chemical treatments include:-

- ★ Pickling to remove oxides, corrosion and contaminants prior to priming and painting steels.
- ★ Deliberate oxide growth by anodising of aluminium to provide better corrosion resistance or painting of aluminum alloys.
- ★ Establishing a consistent good surface to bond or paint for aerospace and automotive component applications or for applying adhesive joints and sealants.
- ★ Electrochemical or electroless plating processes for corrosion protection, decorative appearance, optical attributes, etc.
- ★ Surface treatments of plastics such as use of silane coupling agents, adhesion promoters and Corona discharge.
- ★ Generation of critical interface or interphase layers in multilayer materials.

Analytical work coupled with a detailed process knowledge means that LPD Lab Services can offer practical containment actions and solutions to faults. This can involve changes to the chemistry, process condition modifications and even devising practical process monitoring (Quality Control) methods.

Typical Laboratory Support Work

A new index listing of categorised Typical Laboratory Support Work has been added to the website to illustrate the typical work we do for customers. It aims to give customers an idea of the tailored type of work and projects we conduct on customer's behalf's using the diverse range of equipment available to us.

Customers are also more than welcome to visit the laboratory in Blackburn to discuss potential areas we can help in, and see what we can offer first hand.

For more information on PCB and Electronic Sub-Assemblies, or any other subject mentioned in this newsletter please visit our website www.lpdlabservices.co.uk or feel free to call us on +0044 (0)1254 – 507379.

Website Update

For more information on any of the subjects mentioned in this newsletter, please visit our website or feel free to call us on:

TEL: +44 (0)1254 676 074

WEB: www.lpdlabservices.co.uk

Determination of Painting and Seal History by Filler Fingerprinting

Paints are frequently used in products for corrosion and degradation protection or aesthetic purposes. Rubber and plastic gaskets and sealant materials are used in production plant and commercial products too.

Both seals and paints contain inorganic particles called fillers:

- ★ Extenders reduce the amount of organic compounds required
- ★ Generate better protective properties via increased diffusion path lengths for aggressive chemicals
- ★ Protection against UV depolymerisation
- ★ Generate the required mechanical properties
- ★ As simple colourants

The mixtures of filler materials are characteristic of the specific coating or seal material and act as an ideal fingerprint back to the manufacturer and sometimes even an individual production batch. Combinations of Semi-Quantitative XRF, Optical Microscopy, SEM/EDX and Image Analysis, can provide this. XRF provides a bulk average composition and optical microscopy and SEM/EDX together provide the fine detail. Particle counting techniques and image analysis can generate characteristic volume fractions of specific compounds and the particle shapes and sizes.

This fingerprint information can be used to discover the source of microscopic contaminants such as worn out or shedding gaskets, via a type matching exercise, or even if paint formulations are incorrect or badly mixed giving poor functional properties.

Optical Microscopy & Image Analysis

Optical microscopy allows small features of a sample to be investigated in detail. It is used routinely for preliminary examination and characterisation of a range of samples to ascertain what further work is required. More detailed investigations can then proceed using techniques such as SEM / EDX Analysis, Chemical Analysis, Surface Analysis or reverse engineering.

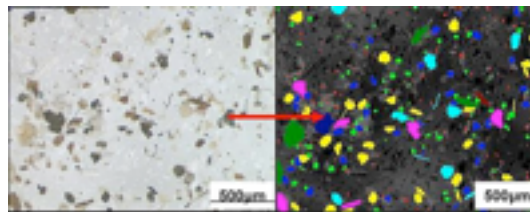


Image Analysis of Dust to Determine Particle Sizes

The laboratory's many microscopes can acquire images in transmission or reflection with a range of lighting conditions chosen specifically to highlight features of interest. High depth of field microscopes can be used to inspect the assembly of different sub-components. Optical Microscopy work includes:

- ★ Cross-sectional examination
- ★ Analysis of structural parts or sub-components
- ★ Metallurgical polished sections
- ★ Analysis of dust samples
- ★ Particle and contamination characterisation
- ★ Porosity measurement
- ★ Corrosion deposits and blistering
- ★ Paint delamination investigations
- ★ Wound management systems

Image analysis covers a range of techniques to gather quantitative analysis or measurements from optical microscopy and SEM images set at contrast levels suited for using the sophisticated image processing software. It provides particle size, particle size distribution, shape and frequency etc..