

# 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 Autumn 2019 edition of LPD Lab Services newsletter.

LPD Lab Services are the experts in material and scientific problem solving for products and processes across all sectors within Quality, Manufacturing, Engineering, Development and Research. Still the uncertainties regarding UK and EU are going on, however the UK demand remains strong for technically innovative products. LPD Lab Services are investigating and solving technical issues within products, process, across facilities and infrastructure ultimately keeping the cost of ownership down.

LPD Lab Services continue to develop innovative and fascinating analytical solutions for in-process manufacturing, finished products and for development of new products & materials. We really pride ourselves with resolving some fascinating and technical problems from across the world. Our scientific credibility and confidentiality is core to our business model!

## Chemical Plant Failure and Material Compatibility

LPD Lab Services consultancy services and analytical testing services have been utilised on site CAPEX asset refurbishment and new build projects and/or in the investigation in supplier failures of CAPEX building/engineering projects when materials fail to meet the standard!

In the life time of site plant operations there will be the need to undertake projects to upgrade and refurbish various assets and facilities such as air conditioning systems HVAC, Heating plants, Boilers, chemical silos, tanks, pumps and filtration.

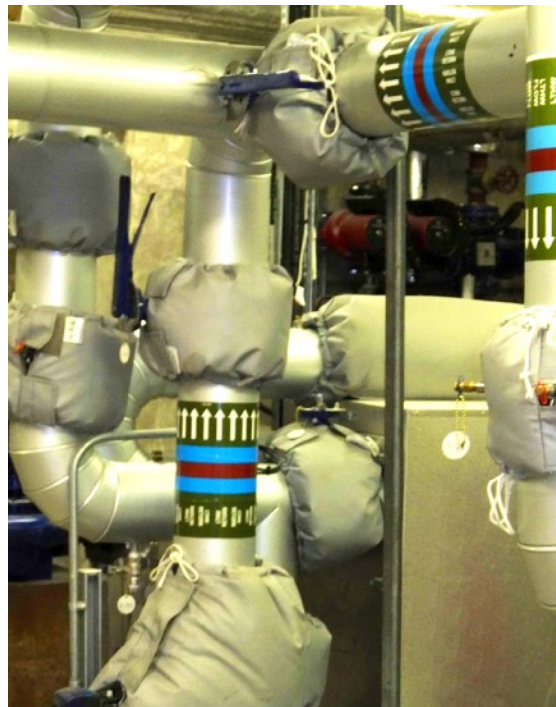
However, poor tank construction or protective liner coating practices can lead to chemical attack by its contents and lead to early life failure of the asset despite apparent appropriate selection of materials.



LPD have found by performing studies we can help you understand the rate of decay, reduce production downtime and reduce your cost in asset replacement.

Tanks, Plant assets and seals can be made from metals, ceramics, plastics, Silicones, elastomers or composite materials such as resin impregnated GFRP (Glass Fibre Reinforced Plastic).

LPD Lab Services uses its combination of consultancy experience and materials failure investigation techniques such as optical microscopy, SEM/EDX, FTIR, IR microscopy, pyrolysis GC-MS, XPS, metallurgical preparation and metallography to reverse engineer plant components to look for signs of insufficient chemical compatibility or poor plant fabrication practices including issues like porosity.



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## Foreign Bodies in Pharmaceutical Products

LPD Lab Services are experts in scanning electron microscopy (SEM) and its practical application in the Pharmaceutical industry. The presence of a contaminant particle can happen in all pharmaceutical preparations - solid dose, liquid or sterile product.

For example in Parenteral administration you could involve a drug being absorbed via the GI Tract, including Intravenous (IV), Intramuscular (IM) or subcutaneous (SC or SQ). A physical quality control evolution is the presence of sub-visible particles. The presence of sub-visible particles or particulate matter contaminant of pharmaceutical products can cause adverse harm to patients. The regulatory authorities ensure a tight compliance on how pharmaceutical products are manufactured however particulate matter contamination can come from a number of different sources.

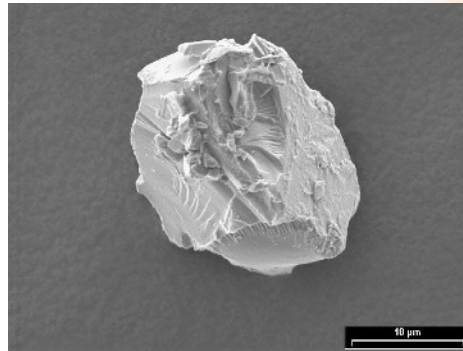
- Sterile solution and drug product
- Ingredients and excipients
- Production process
- Environmental factors (the manufacturing environment, equipment & personnel)
- Product packaging
- Out of the control of cGMP production, The effects of distribution and preparation of the product for administration

There are two possible classes of the source of particulate matter contaminant in solid dose, liquid or sterile product:-

- Extrinsic from environmental contamination, manufacturing equipment, primary packaging e.g. stainless steel, hair, fibres, glass, rubber, operators, skin, hair, foreign body (fly) etc.
- Intrinsic from the formulation, excipients, API, metal, corrosion, fibres etc

Particulate matter contaminant can be analysed in terms of their physical appearance by Scanning Electron Microscope (SEM) and also their chemical elemental signature by Energy Dispersive X-ray (EDX). SEM allows us to understand the surface morphology and texture of the particle and linked with other techniques such as FTIR/NIR, GC-MS will provide further chemical data that allow the identity and mitigate the root cause of the particle and explain its origin with the process or product.

Particulate matter contaminant can also be of concern to products and public safety in Medical devices, healthcare and Aerospace.



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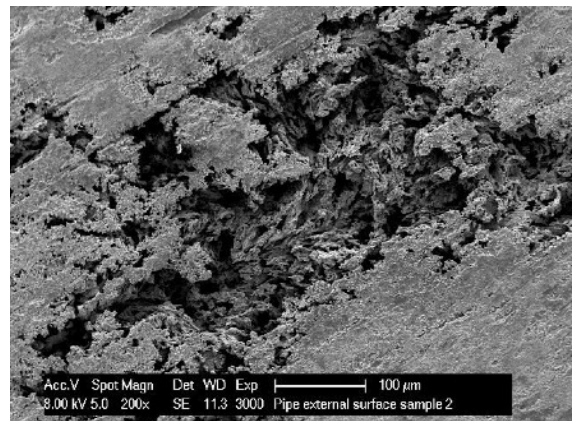
## Phenolic Foam Induced Pipe Corrosion

All facilities using pipework for heating, cooling or ventilation will be insulated and lagged to ensure thermal efficiency. However, the material used can under certain conditions provide a corrosive environment. LPD Lab Services have been working with facility companies, Engineers and insurance companies to understand failure but also to provide expert advice on prevention and repair.

Pinhole or pitting corrosion on pipework are common with copper pipes, steel water pipes and stainless steel pipes when insulated with phenolic foam under damp and wet environmental conditions. These type of pipes are mainly found in industrial applications like heating plants for hot/cold water, air condition (HVAC) or steam plants as the phenolic foam has excellent thermal insulation properties.



Typically samples of failed pipe and foam insulation associated with the leak failure are sent to LPD Lab Services for investigation. The pipework is assessed by optical microscopy as well as SEM/EDX determining the root cause and corrosion mechanism. Additionally the foam insulation is soaked in water and the resulting solution is analysed for pH, to check if it is acidic, and for the presence of aggressive species by Ion Chromatography (IC).



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

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