

## Laboratory Services

Sigma Energy Solutions (Sigma) has a very well equipped investigations laboratory to meet all of your analytical requirements.

The Sigma laboratory provides support for:

- environmental performance assessment (e.g. ambient levels and source emissions, fallout characterisation)
- high concentration slurry technology (e.g. ash characterisation, materials selection and protection)
- fuel technology and steam generator performance improvement (e.g. fuel characterisation, unit cycle and process parameters)
- cooling and heat exchanger performance improvement (e.g. corrosion and fouling investigations, CW chemistry, materials selection)
- plant condition and life assessment (e.g. engineering materials degradation and protection, life extension, refurbishment)

Our high end analytical techniques are used frequently in investigative and forensic analysis. The laboratory is also available to meet your direct process needs by providing contractual services and by answering one-off service queries.



### Service queries

In your process you find a strange substance never observed before. What is it? More importantly, does it indicate a serious problem? Send it to our laboratory and we will examine it atom by atom to solve your problem.

Instruments such as Scanning Electron Microscopy with Energy Dispersive X-Ray Analyser can distinguish features below 1µm in size and identify the chemical composition, or Fourier Transform Infrared Spectroscopy can allow us to fingerprint organic substances to give a positive identification. Because we are industrialists we won't be looking at your problem from an academic or research perspective but with the understanding that it is probably costing you significant money and you need a practical solution fast.

### Contractual services

Sigma can tailor a service to meet your budget and quality needs. We can provide process control data via written reports or directly into your process information system freeing you to get on with your core process operation. Contracted laboratory services are designed to meet your on-going specific process needs using techniques and methods tailored to your industry's standards.



## Techniques and services

In-house techniques include:

- scanning electron microscopy (SEM)/energy dispersive x-ray analysis (EDXA)
- stereomicroscopy, polarising light microscopy (PLM) and metallographic microscopy
- fourier transform infra-red spectroscopy/microscopy (FTIR)
- total organic carbon analysis (TOC)
- thermal analysis including thermo-mechanical (TMA) and simultaneous thermo-gravimetric analysis (TGA) and differential thermal analysis (DTA)
- chromatographic techniques including gas chromatography (GC), high performance liquid chromatography (HPLC), and ion chromatography (IC)
- atomic absorption spectroscopy (AAS)
- ultraviolet-visible spectroscopy (UV – Vis)
- empirical materials tests established for specific needs

If the technique/service you are interested in is not listed please contact us, as we are always interested in establishing new techniques in our laboratory. We also have access to a wide range of other techniques through standing two-way relationships with universities and commercial laboratories.

## Advantages of using Sigma Energy Solutions

Our laboratory is staffed by professional chemists, metallurgists and engineers who are consultants in their own right and can access Sigma's full resources to help solve specific problems.

The laboratory is quality assured to AS/ISO 9001, as is the whole of Sigma Energy Solutions, so you can be confident in the results you receive.

Using sophisticated scientific instruments backed by many years of experience, Sigma can analyse a wide range of industrial samples and provide solutions to complex problems. Some of our instrumental techniques are usually only found in universities or research institutions.

## Cost effective

Not only can Sigma experienced analysts recommend a cost-effective program for your samples but they have the skills necessary to recognise unproductive investigative paths and recommend revised strategies. We also understand the need to tailor analyses to the level of sophistication or accuracy required to meet the level of assurance you need – at the best possible price.