



EXPLORATION AND PRODUCTION PRODUCTION SUPPORT SERVICES

Solutions which span the oil and gas supply chain

intertek
Total Quality. Assured.



A strong commitment to meeting our clients' needs and expectations is at the core of our Production Support business. We have a long-standing reputation for providing high quality, independent services, where trust, expertise and responsiveness are critical values expected by our clients. Intertek's global reach combined with Total Quality Assurance enables us to offer you an unrivalled service, wherever you are.

Our Production Support business line is a world-renowned provider of analytical, consultancy, outsourcing and specialised testing services related to production chemistry, hydrocarbon characterisation, oilfield microbiology, environmental and support services. We form an integral part of Intertek's global Exploration and Production division.

Key to the services we offer is our fundamental understanding of your production systems and

fiscal and offshore regulatory requirements. This, in conjunction with our ability to provide first-line consultancy support including field chemists for both permanent and project site assignments, means we can deliver a full range of services both onshore and offshore to meet our clients' specific requirements.

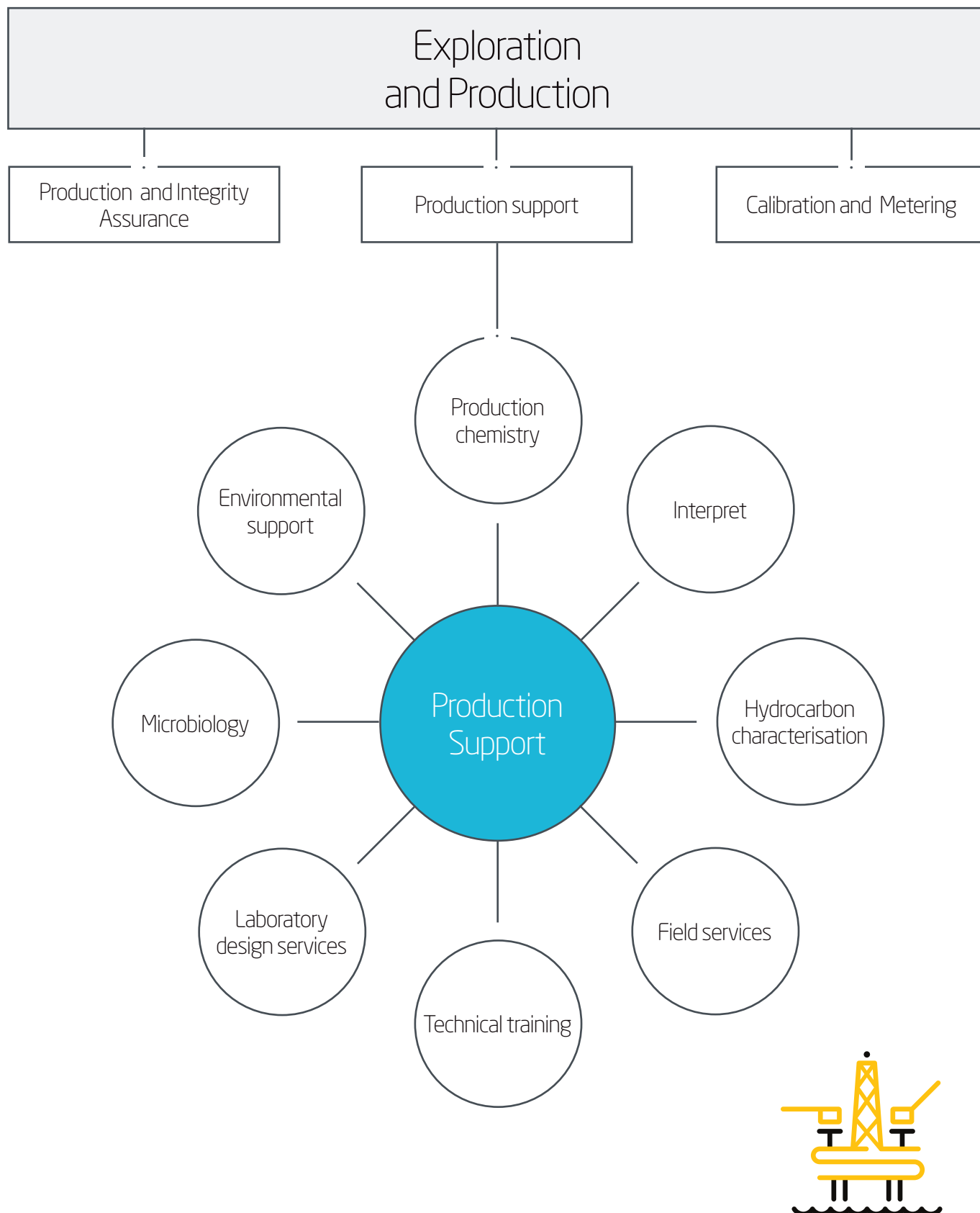
Our expertise, covering hydrocarbon characterisation, water chemistry and microbiology coupled with strong process

knowledge, enables us to deliver a unique blend of services across a broad range of applications.

Accurate fluid chemistry is fundamental to all of our work, as it is with Intertek's entire global network of analytical laboratories. Intertek's global reach and local presence in more than 100 countries means that we can deliver effective, innovative solutions to our worldwide client base.

Our Extended Team - Exploration and Production

Production Support is part of Intertek's Exploration and Production business.



THE INDUSTRIES WE SERVE

Energy

The Global Energy Industry - Oil and Gas

Sourcing energy to meet the evolving and growing needs of the world is a defining challenge of the future and an issue that leaves no one unaffected.

Demand for the secure and sustained supply of energy has never been greater and the future of oil and gas production remains at the heart of this issue. New discoveries are needed to offset field declines and create growth, often in remote and inhospitable locations.

Reserves in frontier regions bring their own set of unique challenges, while diminishing reserves in established regions need original and pioneering methods to maximise extraction.

Further down the production chain, the refining and marketability of heavy crudes is becoming increasingly necessary. However, this can only be achieved through the development and effective utilisation of new technologies, software and refining methods. Oil and gas operators face a plethora of challenges in a fast-moving and competitive industry.

Our laboratories hold a range of accreditations including ISO 17025, ISO14001 and OHSAS 18001



Organisations are under increasing pressure to ensure their extraction and processing methods, practices and technologies are evolving to keep up with a fast-changing market.

Satisfying applicable local and national standards for health and safety, regulatory and

environmental safeguarding across all operations is vital for any operator and tightly managing production costs is an ongoing challenge.

In short, this is a defining age for oil and gas and we are the ideal partner to help you overcome your challenges in a changing world. Working alongside us will give you peace of mind to pursue your business goals in the confidence that all quality and safety aspects of your products and processes are addressed.

Our services can help you to focus on what matters most to your business - growing revenues, increasing market share and achieving greater success.





Hydrocarbon characterisation

Hydrocarbon characterisation can enhance efficiency and productivity through the molecular detailing of crude oil, feedstocks and other petroleum products.

Utilising cutting-edge techniques, our teams work to IP, ASTM, ISO and other recognised international standards to produce detailed information on the molecular and elemental composition of your hydrocarbon feedstocks, intermediate and finished products.

Information of this nature contributes significantly to optimising oil and gas recovery, meeting regulatory requirements, maximising value and improving refiner profitability and efficiency.

Pipeline Allocation

Hydrocarbon allocation is an important facet of any successful multi-entrant pipeline system. Ensuring that each organisation receives hydrocarbons equal to the value of those they contributed presents a significant challenge.

Accurate and reliable analysis is key to verifying product quality, reducing uncertainties and demonstrating compliance with regulated transportation agreements.

A schedule of analysis is agreed between the shipper and the pipeline operator, whereby flow proportional samples are taken at a frequency to satisfy commercial agreements. This analysis typically comprises the determination of water content and hydrocarbon composition, including distillation of stabilised crude oil product for value adjustment purposes.

Crude Oil Assay

Crude oil assay is an essential part of optimising the refining process and establishing factors such as crude quality, feedstock compatibility and necessary production methods.

Operating one of the largest networks of crude oil assay and hydrocarbon characterisation laboratories in the world, we operate to recognised industry standards to provide first-line technical support and timely analysis to optimise refinery engineering, pipeline allocation, process optimisation, exploration evaluation and crude oil marketing.

The procedures involved in crude oil assay can be tailored to specific requirements and results can be incorporated into simulation packages. Alternatively, we can recommend a suitable test suite to meet your organisation's needs.

Oil Condition Monitoring

Costly damage and shutdowns due to lubricant problems can be mitigated and avoided with an effective oil condition monitoring programme.

Providing valuable data to plan maintenance strategies, oil condition monitoring allows for the identification of problems before they compromise plant and machinery system health.

This data enables your engineers to plan preventative action, reduce equipment downtime, lower repair costs, optimise maintenance intervals, extend oil drain periods and reduce capital investment by monitoring a specified set of key parameters.

Our comprehensive and independent services comprise analytical test packages that are tailored to meet the requirements of the specified application and working environment.

Interpret

Unique to Intertek, Interpret is our online and offline analysis package that uses spectra to determine hydrocarbon stream properties. To date, we have adapted Interpret for three primary applications designed to streamline your processes and save you time and costs. Efficient data ordering, extraction and simplification can be achieved through Interpret. The prediction of organic deposition in crude oil blending is possible utilising our organic deposition programme, while Interpret technology enables real-time hydrocarbon composition measurement.

The technology can be used online, at-line and offline and utilised across a wide range of industries and for many functions.

Interpret's myriad potential uses means our teams will continue to develop innovative functions to address your key challenges.

InBlend

Obtaining real-time hydrocarbon composition measurement data, monitoring crude quality and using it to aid future decisions can result in increased productivity, reduced operating and

production costs and ultimately, a growth in profit.

At Intertek, our IBlend system uses advanced NIR spectrum analysis, combined with state-of-the-art topological modelling, to produce fast and accurate data for predicting the properties of hydrocarbon streams.

When combined with online NIR analysers, this cutting-edge technology delivers real-time hydrocarbon composition measurement capabilities to optimise the crude blend.

InFlow

'Opportunity' crudes are being increasingly explored and utilised as refinery feedstock. However, processing these crudes and ensuring they are saleable comes with a unique set of challenges, particularly organic deposition, or the presence of wax and asphaltenes in your product. Our InFlow programme is designed to resolve these issues.

We aim to maximise your crude value by combining quality monitoring and organic deposition constraints, providing an integrated solution to organic deposition.

Our patented InFlow brings together many

elements to achieve this. These include our in-house proprietary technology Interpret, Near Infrared (NIR) spectroscopy, stability and instability assessments, matrix and spectral blending algorithms, microscopy validation and crude quality tracking.

InProcess

The large and complex datasets generated by your laboratories and sensors are key to understanding your processes and operations. However, sorting, deciphering and simplifying data to aid future plans is a significant task.

InProcess is our solution to your challenge. This software is capable of importing large datasets and using advanced analysis tools to expose their underlying structure, trends and correlations. It provides a snapshot of process data, showing representations of behaviour and operations for specific time horizons.

It also analyses the whole dataset, regardless of size, and shows the combinatorial effects of variables on operations. This enables your business to access a data analysis tool that can identify problems that may impact margins.



Environmental support

Environmental compliance is an increasingly important issue in a highly regulated industry. The need to ensure that exploration and production has minimal impact on the environment has never been greater.

Our comprehensive service includes advice on environmental applications, analysis of all emissions and the modelling of effluents discharged into the environment.

The comprehensive environmental consultancy we provide is essential to optimise design and ensure compliance throughout your operations. We work closely with clients to manage environmental risk from exploration through to decommissioning.

Our environmental analytical services are geared towards quantifying emissions. Solutions include gas analysis for EU Emissions Trading Scheme purposes, biannual DECC analysis kits, mercury detection in gas or liquids and produced water discharge - including the measurement of oil content.

Environmental Consultancy

Our team of experienced marine and offshore consultants work where engineering meets the environment.

Considering the environmental implications of a project at the earliest stage allows us to work with clients to remove or reduce impacts through robust environmental impact assessment and determination of Best Available Technique (BAT). During exploration and production, we have extensive experience in the preparation and submission of applications and procedures for chemicals use and discharge, waste management, produced water and atmospheric emissions.

Our offshore modelling team provides a sound understanding of how your assets will interact with marine, coastal and river environments.

We can review operating parameters alongside environmental conditions to help determine if operations will impact the local environment, providing valuable data to inform your environmental planning procedures and strategies.

With us as your partner, you will gain peace of mind that you are operating within the legislative framework so your activities can proceed on time and within budget.



Production chemistry

Production Chemistry

Efficient use of chemicals and a comprehensive knowledge of their applications enhances productivity and ensures that your production chemistry practices are at their optimum.

We offer a complete range of services that help solve problems associated with produced water processing, reservoir souring, pre-commissioning corrosion procedures, microbial corrosion, emulsion, scale, wax and hydrate issues.

Possessing over four decades of experience, our reputation for tackling key industry problems puts us at the forefront of providing valued production chemistry support and chemical management services.

These include fluid characterisation, software simulation and predictive modelling, chemical selection and optimisation, testing, field monitoring and chemical treatment evaluation and compatibility.

Water Analysis

Oil and gas processes require the management of a range of waters, from produced water that must be monitored to meet legislative or reinjection standards to the vital potable supplies on offshore platforms and boats.

The analysis of this water is important to maintain system health and typically forms part of a comprehensive management strategy.

We specialise in analysing a wide range of waters for the oil and gas industry, including reservoir, potable and other aqueous fluids such as glycols, amines, heating and cooling mediums.

Enabling access to much-needed support at short-notice, our fully trained personnel are available to undertake both onshore and offshore sampling.

Solids and Deposits Analysis

Unknown substances in fluids and equipment can jeopardise their integrity, directly disrupt production and may lead to equipment repair or replacement. Unforeseen issues can cause contamination upstream of the site of any deposition. When it comes to potable water supplies, rapid analysis

is critical to detect contamination. We adopt a systematic approach, applying advanced techniques and expert knowledge and experience, to determine composition.

This includes quantifying moisture, organic and hydrocarbon content and characterising inorganic materials.

We also conduct particle size analysis, solubility trials, structural analysis by x-ray diffraction and the identification of chemical contamination to mitigate risks to your systems and processes.



THE INDUSTRIES WE SERVE

Microbiology

Microbial activity is the root cause of numerous oil and gas production challenges, including souring, H₂S production, microbiologically influenced corrosion (MIC) and biofouling.

From our microbiology centres of excellence, our teams provide a full suite of services to understand and address the causes of these issues and provide advice on your microbiology management strategy.

Oilfield Microbiology

Sulphate Reducing Bacteria (SRB) is a major source of microbial issues for oil and gas operators. Along with other complex factors, unchecked SRB activity causes serious problems such as corrosion and souring.

Our oilfield microbiology team carries out regular surveys of offshore and onshore sites to determine the levels of microbial contamination relating to MIC and souring. We can determine a system's problem areas and advise on treatment strategies and management programs that enable you to gain control over microbial issues.

We also offer chemical testing solutions,

which can incorporate the testing of biocide efficiency against mixed oilfield cultures for various applications.

In addition, our teams can perform diesel quality testing and management, including supply chain and end user testing and surveys.

Bugtracker

Our BugTracker management system is a unique online tool that helps to effectively manage microbial monitoring and trending. We set up bespoke sampling and systems for each individual client to ensure the most effective data can be gathered and interpreted. This allows for timely action to be taken in order to prevent microbiological problems.

Potable Water Testing and Management

Potable water is vital to all sites and is used daily for cooking, drinking and showering. Effective systems to manage these water supplies must be put in place otherwise water quality and the health and safety of personnel can be significantly compromised.

Our experienced health and hygiene experts carry out legionella risk assessments and

water quality audits across a range of sites, from oil rigs to office buildings.

We can offer UKAS-accredited analysis on potable water for drinking quality and we commonly test for legionella, E.coli and Enterococci.

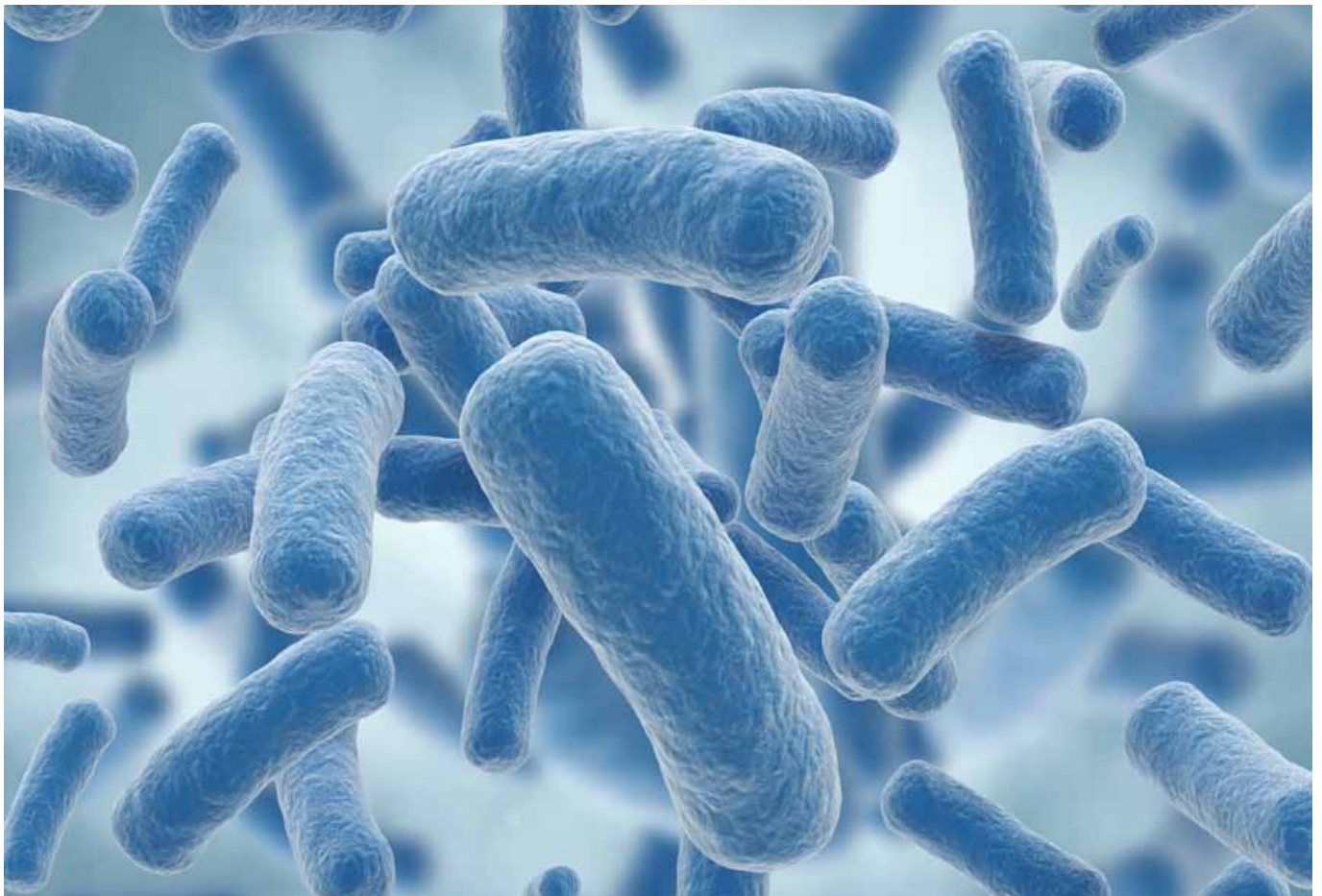
Microbiology Retail Products

We provide a range of products that offer you greater control over microbial monitoring practices, with our retail team manufacturing and dispatching microbial growth media to clients worldwide.

These media test kits are designed to be used in the field for the ongoing monitoring of microbial contamination.

Our specifically designed and engineered Sidestream® devices are used to monitor sessile microbial population without the need for intrusive sampling. Monitoring fluctuations in biofilm formation rates and population numbers can assist in the optimisation of biocide treatment regimes.

We also provide support in supply of consumable and chemicals where appropriate.



Field Services

In a competitive industry relying on deadlines and timely service delivery, the necessity to seek outside expertise can often arise.

To meet your requirements, independent service providers need to be reliable, understand your issues and add value to your operations.

Providing consultancy, design and implementation guidance, vital laboratory equipment and suitably-trained, qualified personnel are fundamental strengths of our business.

With us as your independent field services provider, you will gain peace of mind and the time you need to focus on your core business activities.

Technical Manpower Supply

Experienced oil and gas personnel are crucial to maximising productivity, safety and cost-efficiency.

We help our clients achieve operational continuity and seamless production with our suitably qualified and experienced consultants, chemists and microbiologists who are on hand for permanent or ad-hoc services.

A select group of Intertek field experts is available to undertake project work, holiday and sickness cover at short notice at your required locations.

We understand the positive impact made by properly trained, experienced individuals and will engage with you in pre-job meetings to ensure that our employees' skillsets and capabilities match your needs.

Sample Cylinder Management

Pressurised sample cylinders are vital components of liquid or gas analysis and ensure that samples are representative of operating conditions.

Sourcing, purchasing, transporting and storing sample cylinders can be a costly and time-consuming task. As a key function of our laboratory service, we can proactively manage the supply of suitable cylinders to your sites.

Our reliable and efficient cylinder management package includes rental, maintenance, re-certification and cylinder tracking.

We aim to assure your confidence in the integrity and validity of your cylinders while saving you time and resources.



Laboratory Design Services

The unique and complex nature of oil and gas projects demands allowance for numerous variables, so a one-size fits all approach to laboratory design and construction is insufficient.

Our dedicated teams can offer you bespoke detailed laboratory design, incorporating elements such as export specifications, international test methods and procedures, sampling frequencies and equipment lists.

Initial designs typically include all vital considerations from furniture planning and fume extraction to waste management and legislative and environmental requirements.

Our capabilities include catering for the needs of A60 zone-rated modular laboratories and the required planning for FPSOs and FLNG vessels.

Laboratory Procurement

Ensuring your laboratories are equipped with requisite equipment, including spares in case of failure or emergencies, is essential for seamless production.

Our established and far-reaching supply network will ensure you are never short of the apparatus critical to your operations.

As a global, single-source supplier of laboratory

packages, we can handle the purchasing of test equipment, laboratory furniture, work benches, storage cabinets, fume cupboards, start-up chemicals, consumables, pressure-control and heating, ventilation and air-conditioning systems.

Our comprehensive services can provide bespoke modular laboratory solutions complete with operating manuals and procedures and the spares and equipment essential to your operations.

Laboratory Equipment and Consumables Supply

Long-term projects often require the establishment of laboratories in onshore and offshore locations.

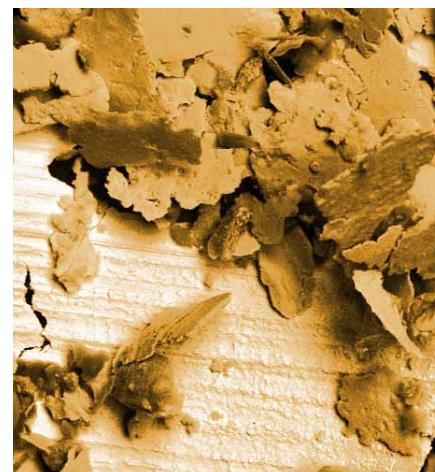
Specifying the resources, equipment and consumables required at the early stages of a project can be problematic, especially when they exceed their original projected timelines.

With our in-depth knowledge of critical laboratory equipment and consumables, we can assist in ensuring that your laboratories are equipped to meet your requirements.

Our solutions include the provision of equipment typically needed in these

environments, from instrumentation and laboratory chemicals to reagents and glassware.

Through our extensive network of providers, we can quickly source and procure field apparatus and supply equipment on a rental basis where necessary, assisting you in minimising downtime due to equipment failure or a lack of critical spares.



THE INDUSTRIES WE SERVE

Technical Training

Your employees are integral to delivering the operational excellence necessary to further your business. However, arranging regular training and ensuring that their skills are up-to-date can present a challenge.

At Intertek, we provide comprehensive training with the aim of making upskilling your employees as easy as possible and assist you in maintaining safe and productive workplaces.

Our technical training solutions are designed to equip your personnel with the knowledge, skills and tools necessary to deliver operational excellence.

Recognised Expertise

We utilise the unparalleled knowledge of our experts to provide your teams with world-leading independent oil and gas training courses. Our workforce is made up of a diverse range of professionals who deliver our courses, passing on their academic and practical knowledge to your people.

Many of our employees are recognised globally as experts in their fields, maintain consummate academic credentials and hold decades of experience in providing solutions

for clients. Several are respected industry thought leaders and host presentations at conferences, symposiums, trade shows and workshops.

Intertek Oil and Gas Courses

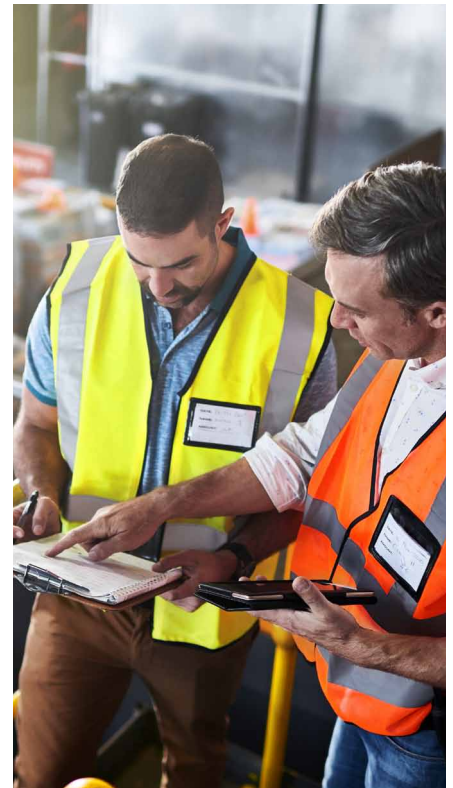
The wide range of courses we provide can be either scheduled or bespoke and delivered through classroom training, web-based theoretical learning, practical activities, competency assessments or a combination of these.

You can opt for training at our fully equipped centres of excellence or onsite at a location of your choice.

Oil and Gas training Courses include:

- Oilfield microbiology
- Legionella awareness for duty holders
- Legionella and water hygiene management
- Offshore legionella awareness
- Oil in water training

Our extensive expertise and comprehensive industry experience make us the ideal partner to deliver the high-quality oil and gas training your teams need to maintain optimum performance.



Related services



Production Support forms part of Intertek Exploration and Production, which also includes our Upstream Services, Production and Integrity Assurance and Calibration and Metering businesses.

Providing pioneering analytical and scientific services and consultancy, we support our clients across the entire oil and gas value chain - from reservoir to refinery.

Environmental, Energy, Water Consultancy

Intertek Energy and Water Consultancy Services (EWCS) provides technical solutions to complex environmental and regulatory challenges.

Increasingly, the demands of engineering design and asset operation are meeting the constraints of the environment in marine, river and land-based projects.

EWCS assists clients in making sound financial, environmental and engineering decisions that reduce risks and costs without compromising quality.

The team has spent over 30 years working as advisors and project managers through all stages of offshore development - from

concept, feasibility and design through to construction, operation and decommissioning.

Technical Inspection Services (TIS)

For decades, the global TIS team provides world-class inspection, expediting, technical auditing, site construction support and technical staffing services.

Assuring the quality of products, processes and assets, TIS assists you in minimising not only quality risks but also safety risks that could negatively impact personnel and the environment.

Decommissioning

The move towards cessation of production and the eventual decommissioning process can be complex and challenging.

We deliver a range of specialist decommissioning services focussed on helping our clients minimise environmental impact and operational risk.

Our engineering and scientific experts provide support on asset integrity and the re-use or recycling of equipment with the aim of helping you to reduce costs and minimise disposal issues.



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