



OIL & GAS

PRODUCTION & INTEGRITY ASSURANCE SERVICES

Delivering independent consultancy and specialised testing services

intertek
Total Quality. Assured.



Our extensive experience in delivering site services, coupled with high-end laboratory studies and consultancy advice sets us apart from the competition and enables us to deliver Total Quality Assurance solutions to our clients

With many new developments being operated in ever more challenging environments, and ageing assets reaching the end of their design lives, the review, assessment, selection and management of corrosion and materials is more critical than ever from both a safety and financial perspective. Similarly, effective management of a range of production chemistry issues is essential to avoid costly shutdowns and workovers. Intertek's Production & Integrity Assurance experts are world-renowned provider of specialised testing, consultancy and monitoring services related to the management of corrosion, materials performance and production chemistry. Our global reach means that we service a worldwide client base through our Centres of Excellence in the UK and USA and satellite facilities in the UAE, Oman, Malaysia and Australia.

Corrosion & Materials Testing

Advancements in technology in many industries, coupled with challenging operating conditions, means that greater demands are made on materials, such as higher temperatures and pressures, making it essential that the right materials are selected. The evaluation of corrosion and materials degradation under simulated service conditions has been a core part of our business for over 40 years.

Environmentally Assisted Cracking: We are experts in sulfide stress corrosion and hydrogen induced cracking tests which are carried out in accordance with internationally recognised standards. Slow strain rate testing equipment, including autoclave SSRT, is available allowing us to study all aspects of these cracking mechanisms.

Corrosion Fatigue: Intertek has operated a corrosion fatigue test facility for many years with a particular emphasis on testing of high strength wires used in offshore flexible pipes. Used in conjunction with pressure vessels, our test rigs enable us to replicate pressurised aqueous environments, but can be modified to allow testing in any type of liquid environment. Test and equipment is designed in collaboration with clients in order to replicate the required service conditions and test parameters.

Corrosion Inhibition: We have a long-standing reputation for fundamental studies relating to corrosion inhibition, test method development and chemical selection. We also perform field trial validation tests. Expansion of our laboratory capabilities within the Intertek network allows us to provide these high level services in UAE, USA and Malaysia as well as at our Centres of Excellence in Manchester, U.K. and Houston, USA.

Non-Metallic Materials: Our capabilities includes materials and chemical compatibility testing, performance evaluation and lifetime prediction which have been undertaken for umbilical hoses, flexible pipe, seals, linings and coatings and items for downhole service, including linings for tubes. Chemical ageing and compatibility with oilfield treatment chemicals in produced fluids (including sour service) are undertaken at standard laboratory conditions (ambient pressure) while high pressure and temperature tests take place in our autoclave facility. We perform explosive decompression testing for seals, subsea connectors, flexible pipe linings and hoses, and have capabilities and expertise for coatings testing.

Advanced Materials Characterisation: In addition to our own extensive materials capabilities, we can manage a wide range of advanced studies carried out at other Intertek

laboratories and have access to state-of-the-art equipment (including ESEM, TEM, XRD, XPS, SIMS, FTIR techniques) in the EU, USA and worldwide.

Production Chemistry & Microbiology

Operators frequently rely on our high level production chemistry expertise to gain a greater understanding and improved management of a range of issues to avoid costly shutdowns and workovers.

Microbiological Control: Specialising in identification and mitigation of reservoir souring and microbiologically influenced corrosion, our research and development team has developed new monitoring tools and control strategies which can improve productivity, and we are at the forefront of applying the latest molecular analysis technologies.

Reservoir Souring: Intertek's reservoir souring model can be used as a predictive tool for future souring patterns simulating: microbial generation of H_2S , transport and scavenging of microbially generated H_2S and partitioning of H_2S between various fluid phases.

We are a leader in the evaluation and optimisation of souring control measures such as nitrate treatment and also provide advice on the consequences of souring with respect to materials degradation.



Hydrotesting / Mothballing: There is increasing pressure from regulatory authorities to justify and minimise the use of toxic chemical discharges arising from chemical treatments used to mitigate problems associated with sulfate-reducing bacteria (SRB). We have a strong track record in providing laboratory and field services to ensure reliable pipeline corrosion protection during hydrotest and wet lay-up.

Scale Management: It is common practice to use water injection for reservoir pressure maintenance, combining seawater, aquifer waters and/or recovered production water with consequent risks of scale formation, injectivity and production loss. We provide field tests, audits and troubleshooting, scale modelling and laboratory evaluation of scale inhibitors.

H₂S Scavengers: Heightened concerns about safety and environmental impact of traditional scavenging technologies have prompted the introduction of new H₂S scavenger chemistries, generating a need for guidance on their application and performance. We provide a range of scavenger services including H₂S scavenger behaviour in all fluid phases; atmospheric pressure test rigs to test at partial pressures of H₂S; autoclave facilities to test at a wide range of pressures and temperatures and kinetics of H₂S removal under specific process conditions.

Health & Hygiene: We carry out legionella risk assessments as laid out by the UK Health & Safety Executive's Code of Practice, and can implement our web-based legionella system to ensure legal obligations are fulfilled.

Consultancy

Intertek has an established team of highly qualified engineers with vast experience and core competencies in corrosion fundamentals, corrosion management, materials selection, sour service, corrosion resistant alloys, cathodic protection, stray current, non-metallic materials, corrosion monitoring and failure investigation.

Materials Selection: Ideally, we are involved at the design stage, but can be involved at any stage to ensure correct materials selection or to advise what can be done to mitigate degradation problems. We have expertise relating to internal process environments and their impact on carbon steels, CRAs, non-metallic materials and concretes. Similarly, we have broad experience in external environments and how these can affect degradation. When unusual conditions are expected, theoretical assessment and specification may not be possible. In this case, we have the ability to conduct selection by appropriate testing.

Corrosion Management: Intertek was the main author of the original UK HSE Corrosion Management Guidance Document which has since been adopted across several regions around the world. We conduct corrosion management audits of existing systems and provide pipeline corrosion risk assessments based upon statistical uncertainty modelling principles.

In addition, we cover broader risk-based assessment / inspection and fitness for service assessment working with other specialised units within Intertek where necessary. We provide ongoing support to back up corrosion management solutions with support to on-site and remote condition monitoring needs and development of inspection and monitoring plans including Risk Based Inspection (RBI).

Corrosion Control Design: Our extensive experience in the selection, design and specification of corrosion control measures includes:

- Material selection
- Coating selection and specification
- Cathodic protection design / specification / troubleshooting
- Chemical treatment requirements (including

corrosion inhibition, biocides, scale inhibitors, wax control, demulsification, hydrate inhibitors, etc.)

- Hydrotest planning

Failure Investigation: When a failure occurs, it is important to understand why in order to avoid recurrence. Our team investigates failures covering all manner of components and materials and involves other Intertek business units where necessary to provide a truly managed service. Our expertise extends to failure investigations and causation studies, often for the legal and insurance industry, supporting clients from the initial site assessment through to expert witness court appearances. Our specialist expertise assists in determining root cause, failure mechanism and whether it requires an engineering and / or management solution.

Corrosion Monitoring in Concrete

Deterioration of transport infrastructure such as road bridges is of growing concern and has come under scrutiny in recent years.

Reinforced concrete structures can be highly durable and long lasting, however, they can suffer from premature degradation. Corrosion can affect steel reinforcement bars causing early failure. Intertek's dedicated team of Oxford-based engineers designs and builds a wide range of instruments for corrosion monitoring to suit a variety of needs and environments.

Corrosion Monitoring in Water Systems:

We provide specialist solutions for corrosion monitoring in water systems which measure a range of parameters to help optimise treatment regimes and better manage assets.



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