

Scaled Solutions

A specialised global chemical testing laboratory

Quality, Integrity, Safety & Excellence

British Assessment Bureau
UKAS MANAGEMENT SYSTEMS
8289
ISO 9001
QUALITY MANAGEMENT

www.scaledsolutions.com

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About Scaled Solutions

Scaled Solutions is an independent laboratory and consultancy company established in 1999 to service the Oil and Gas industry. Our customers are global operators, vendors and chemical manufacturers who require technical expertise to solve challenges and validate decisions critical to production chemistry, flow assurance, corrosion, formation damage and energy transition services.

We offer independent services and innovative solutions delivered by industry-leading experts in state-of-the-art facilities. In addition to laboratory testing, our capabilities include, modelling, consultancy, training, R&D and equipment design.

Scaled Solutions pride ourselves in providing a high quality service, and was successful in achieving registration to ISO 9002 in March 2000 and subsequently progressing to ISO 9001: 2000 in March 2001 and to ISO 9001:2008 in April 2008. We transitioned to ISO 9001:2015 in July 2018 and have maintained our quality standards.

We know that quality matters so we'll always keep up to date with current standards.



Dr Gordon Graham is the Managing Director of Scaled Solutions. Being active in production chemistry and flow assurance for over 25 years, he is a recognised industry expert.

Scaled Solutions was established 20 years ago with only a handful of staff in a small industrial unit in Livingston, Scotland with a vision to become a truly international company. Today, we have achieved our vision and boast a large team of dedicated chemists, geologists, mathematical modellers, analysts and engineers across our international locations in the UK, Middle East, USA and Malaysia.



Our headquarters in Livingston, UK



Our office and lab in Abu Dhabi



Our Houston, Texas lab



Our newest office in Kuala Lumpur, Malaysia

Our Mission

To be recognised worldwide through our independent specialised laboratories as the leading supplier of bespoke equipment, training, consultancy & provider of solutions to challenges in Production Chemistry,

Our Culture & Values

"We will meet or exceed our customers' expectations and improve our service to our customers on a continual basis"

Team Work & Communication

Continual Improvement

Openness & Transparency

Trust

Meet our team

Our team has grown exponentially over the years as the company has experienced considerable growth. From starting out with just a handful of staff, Scaled Solutions now boasts over 60 highly experienced members.

Our number one asset is our people and without them we wouldn't be a global company, helping a variety of clients in the field. We employ, dedicated chemists, geologists, mathematical modellers, analysts and engineers to help with a variety of projects and services.

Dr Gordon Graham	Managing Director

UK Team

Gill Ross	Technical Manager
Dr Sam Wilson	Operations Manager & Senior Technical Advisor (Formation Damage)
Dr Sarah Dyer	Senior Technical Advisor (Production Chemistry)
Dr Neil Goodwin	Senior Technical Advisor (Production Chemistry)
Dr Dario Frigo	Senior Technical Advisor (Production Chemistry)
Dr Andrew Farrell	Senior Technical Specialist (Organic Deposits)
Andrew Rafferty	Senior Technical Specialist (Performance)
Dr Andrew Fyfe	Senior Technical Specialist (Special Projects)
Stuart Gordon	Senior Technical Specialist (Analysis)
Ross Crockart	Engineering Services Manager

International Team

Daniel Boyde	International Business Development Director
Dr Robert Stalker	Technical Manager, UAE
Ian Littlehales	Technical Manager, USA
Dr David Nichols	Laboratory Manager, USA
Andrew Ewing	Regional Manager, Kuala Lumpur

Our Services

At Scaled Solutions, we offer a range of services to help find solutions for problems that our clients may have. Our expert scientists can provide testing and analysis for ease of mind.

Core Flood

Our core flooding experts work in our state of the art core flooding labs to help clients with hydrocarbon flow assurance.

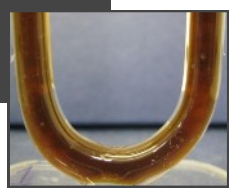


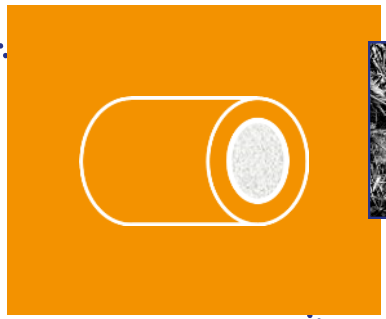


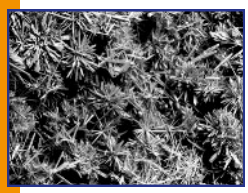
Organic Deposits

We have developed bespoke equipment to investigate and mitigate the formation of asphaltenes, wax and naphthenate deposits.









Inorganic Scale

Scaled Solutions are renown experts in production chemistry. We provide testing solutions for inorganic scaling.





Corrosion

At Scaled Solutions we offer a range of corrosion testing services.

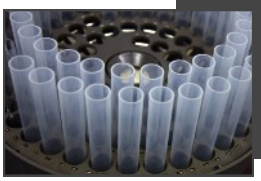
Analysis

At Scaled Solutions, our analysts use a variety of techniques both standard industry tests and in-house developed methodologies.



Research & Development

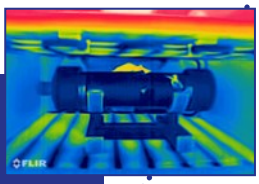
Research and development is integral to Scaled Solutions. We constantly want to experiment and find new ways to help solve our client problems.



Consultancy, Training & Modelling

Not only do we offer a range of chemical testing, we provide consultancy and training courses to our clients and offer modelling services for full-field and near-wellbore simulations.





Global Energy Transition

Supporting companies navigate the operational risks found in emerging low carbon technology and the decarbonization of existing industries.

Engineering

Our scientists use equipment that our engineers have built in house. We also sell bespoke rigs that suit client's needs and wants.



Core Flooding

The Core Flooding Team draws on high levels of industry experience in Petroleum Geology, Chemistry and Engineering to provide the highest level of service to new and existing clients for hydrocarbon flow assurance.

With world-leading laboratory facilities, bespoke and case-specific protocols, and a team consisting of highly-qualified core flooding experts, the Core Flooding team have assisted a range of worldwide clients.



Formation Damage Assessments, Testing & Core Analysis you can Trust

Scaled Solutions

Scale inhibitor retention and release

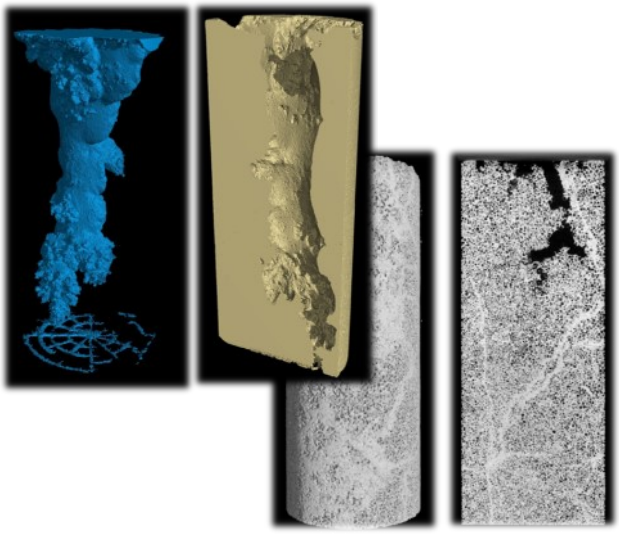
Core flood tests are effectively utilised for management of field specific scaling issues. Scaled Solutions has extensive knowledge and experience of current inhibitor chemistries and have been integral in the development of appropriate analytical techniques to determine inhibitor concentration.

Drilling fluids, completion fluids and breakers

Our high specification bespoke test rigs allow assessment of the Formation Damage potential of oil- or water-based drilling & completion fluids under full reservoir conditions, for 3-phases (oil / brine / gas) and at HTHP. With our advanced test protocols, we are able to examine complex sequences.

Formation damage

The Core Flooding Team at Scaled Solutions employ state of the art rig equipment and techniques to evaluate oilfield chemicals, protocols and sequences. We have standard protocols for evaluating Inhibitors, Dissolvers, Diverters, Biocides, Drilling Fluids, Completion Fluids, Breakers and other oilfield chemicals .





Water injection

In addition to formation damage testing to support producer well operations, Scaled Solutions has extensive experience in laboratory testing to examine water injection feasibility.

Enhanced oil recovery

Scaled Solutions offer EOR core testing services. For advanced tests, our bespoke rig and enclosure is optimised to allow the use of live and re-livened fluids.

Core preparation and analysis

When it comes to formation damage assessment, analyses are vital tools for interpreting core flood test results. Scaled Solutions offer a wide range of analyses to assist with core selection and formation damage diagnosis.

Global Energy Transition

The multidisciplinary team involves a blend of Chemists, Geologists, Engineers and Project Managers who are driving a change in the energy transition arena.

We have combined our expertise in new projects and targeted areas with the aim to solve real world challenges that may impact the delivery of low carbon projects.

Global Energy Transition Services

Utilising the skills of the fossil fuel industry workforce will be critical in successful delivery of the global energy transition, including emerging low carbon technologies (geothermal/hydrogen) and decarbonisation of existing technology (via CCUS).

Scaled Solutions is uniquely placed to provide support in assessing and overcoming the inherent operational risks companies will face when pivoting towards these technologies. We intend to be the lead scientific and technology support partner to energy companies and chemical vendors during the great global energy transition and carbon reduction endeavours.

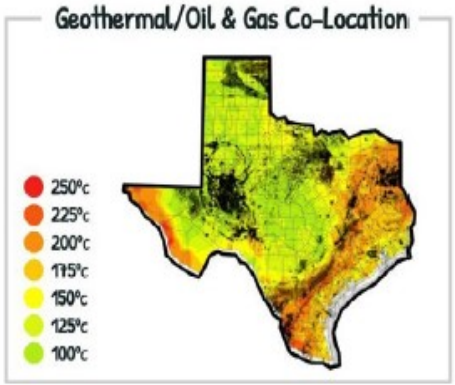
Multidisciplinary Team

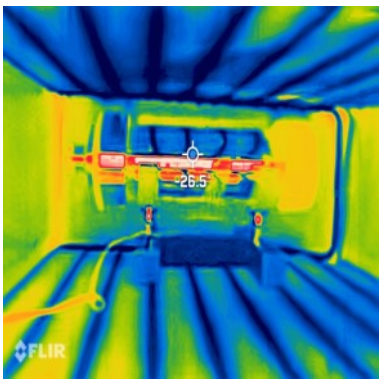
We boast a multidisciplinary team involving a blend of Chemists, Geologists, Engineers and Project Managers who are driving change in energy transition. We have developed laboratory testing technology during CCUS injection and Geothermal operations. Using this technology, we have begun developing best practice lab protocols which can be used to

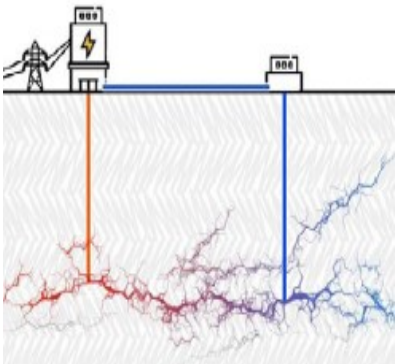
⇒ assess the degree of risk anticipated

⇒ research potential mitigation options

⇒ provide industry standard testing qualification programs fine-tuned to each emerging industries particular requirement







Supporting the delivery of Low Carbon Projects

Scaled Solutions

We are combining our expertise in new projects and targeted areas including:

⇒ Geological Storage

⇒ Geothermal

⇒ Environmental Testing

⇒ Corrosion Testing - Extreme Environment Integrity and Materials Selection

⇒ Dynamic CO_2 Flow Testing in Reservoir Core or Cement

With the aim to solve real world challenges that may impact the delivery of low carbon projects.

Geothermal

The biggest risks in Geothermal will be organic scale control (particularly silicates) and material integrity. We provide testing services and build laboratory equipment allowing for laboratory assessment of these risks and potential mitigation at the high temperatures anticipated in the fields (> 200°C) along with field modelling using FlowiT Scale which does not extrapolate to the high temperatures when modelling scaling risk but conducts calculations based on real data points collected in SSL lab tests at ultra high temperatures and pressures.

CCUS/CO_2 Injectivity

Changes in injecting pressure and rates from several CO_2 sources with various contaminants/ impurities.

Joule Thompson effects with CO_2 injection

⇒ Transportation pressure loss causing CO_2 phase transitions– the associated supercooling can cause pipeline embrittlement and failure

⇒ CO_2 Hydrate formation risk at the near wellbore due to sufficient drops in temperature

Cement Integrity

Cement well integrity failure risks after prolonged exposure to CO_2 and ultra-low temperatures (depleted reservoir CCUS storage) or ultra-high temperatures/ high salinity brines (Geothermal)

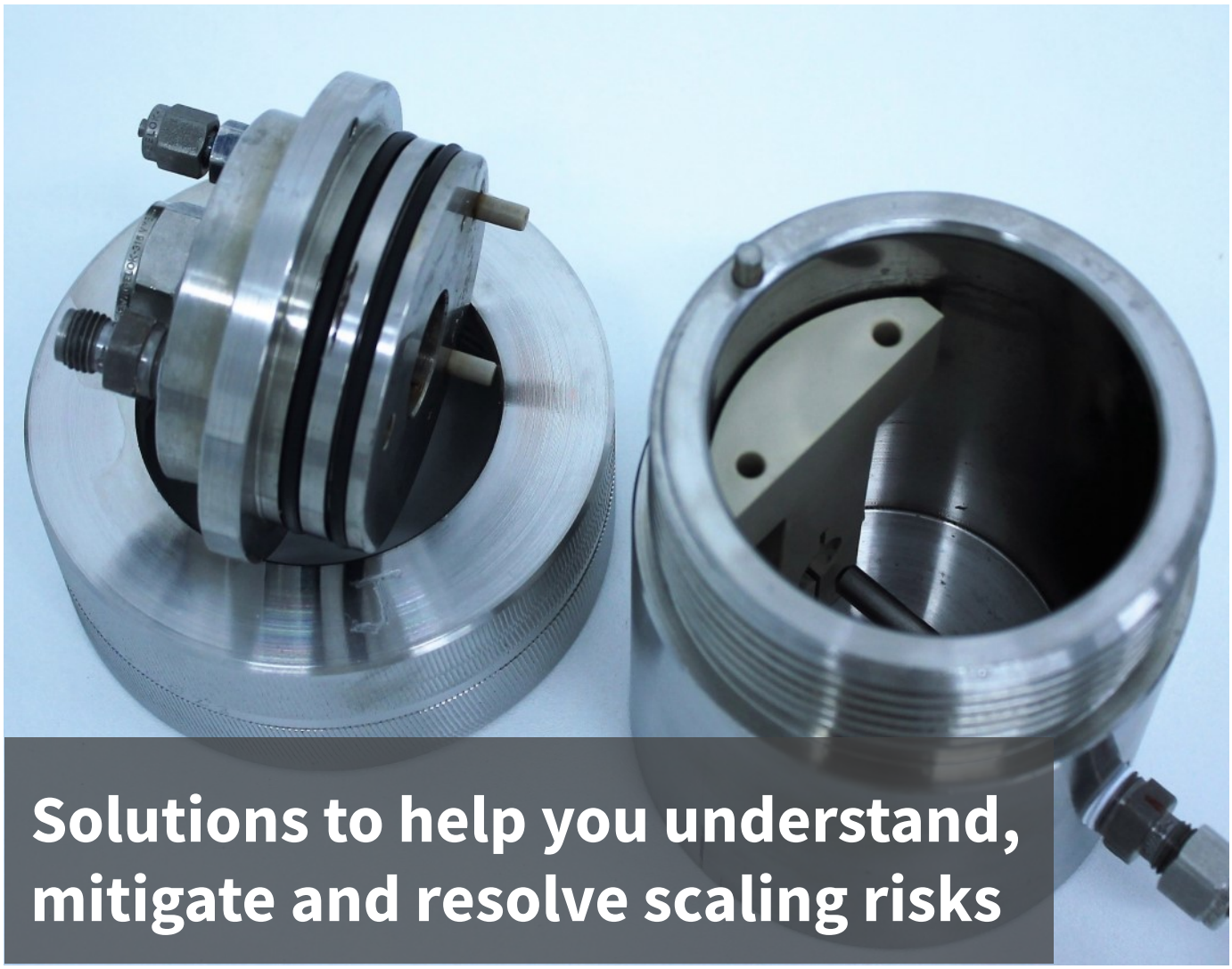


Inorganic Scale

Our expert senior consultants can support your business with assessing the scale risk in your production system by working with you to review your field data, conduct scale prediction modelling and provide recommendations on strategies to mitigate and resolve potential risks.

Where scale inhibition via chemical deployment is desirable, we can propose appropriate test programs to determine the best chemistries for your system including best in class chemical qualifications. We provide scale formation, inhibition and dissolution studies for conventional and exotic scale species under field representative conditions. Quality results are produced and reported through our decades of experience, expertise and in our state of the art facilities.

Tests are supported by in-house analytical services to qualitatively and quantitatively characterise deposited solids. Following selection of the best performing chemicals, our laboratories offer extended services that can then ensure that the chemicals are suitable for the designed method of deployment.. Effectiveness of squeeze treatments are assessed via core flood testing, downhole continuous injection application testing, gas lift application testing and material compatibility testing.



Solutions to help you understand, mitigate and resolve scaling risks

Scaled Solutions

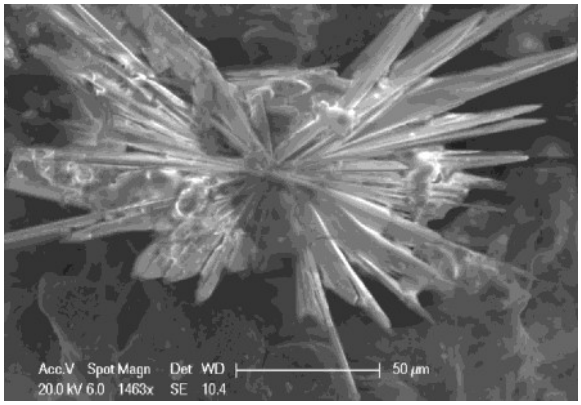
Scale Testing

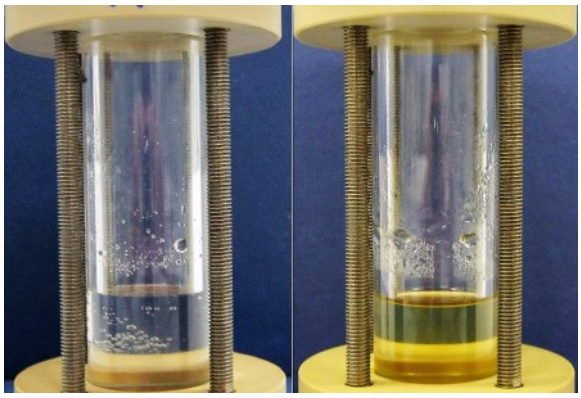
Scale testing protocols have been established together with custom-designed equipment, allowing chemicals performance testing under field representative field application conditions, critical for today's challenging production environments. This includes a variety of equipment that can test a range of conditions, from simple ambient pressure type test conditions (bottle type tests), up to higher temperatures and pressures, e.g. Ultra High Pressure High Temperature (UHPHT) up to 250° C & 19,000psi. Testing of varying shear; stagnant to high shear conditions, and at a range of flow volumes (millilitres to 10's litres per minute).

H_2S Scavengers

As H_2S scavengers are widely used within the oil and gas production industry on a continuous or batch basis, their performance and side effects require testing. Also, compatibility with other chemicals requires laboratory testing prior to field application. Sulphide scavengers, can also cause significant scaling issues depending on the field conditions.

Scaled Solutions provides laboratory tests designed to assess scavenger performance, measure the impact on alkalinity, generate data to support scale prediction modelling and verify scale predictions using dynamic scaling tests. Projects can also be designed to evaluate the chemical compatibility of scavengers with other production chemicals.







Types of scales investigated include:

- Conventional scales
- Iron scales
- Sulfide scales
- Silicates
- Halites

Scaling formation and inhibition as a consequence of:

- Self-scaling conditions
- Mixing of incompatible waters
- Changes in production conditions
- Enhanced Oil Recovery operations
- H_2S scavenger addition
- Stimulations– spent acid production
- Evaporative processes

Other:

- Sulphate removal limits required to prevent scale

Our facilities include:

- Expert consultancy
- Specialist high temperature visibility cells
- Static bottle tests
- Dynamic tube blocking
- Jet impingement
- High pressure high temperature autoclaves
- Large flow pilot rig
- Evaporative halite testing

Corrosion Testing

Maintaining the integrity of oilfield equipment is essential to its safe operation and to maximise the efficiency of production. Scaled Solutions' corrosion department provide a full range of electrochemical and coupon weight loss laboratory corrosion testing under different conditions including ambient and elevated pressures and temperatures under both sweet and sour environments. We also provide application specific and specialized testing and services.

This typically relies on careful material selection combined with chemical applications that either aim to shield the steel physically from the corrosion environment or to favourably alter that environment.

To determine this, it is prudent to carry out a detailed background review, modelling and representative laboratory testing.

At Scaled Solutions we offer a range of services in order to adequately support this taking into account the key aspects from the field.

Each project is tailored and designed for specific requirements, and utilises the knowledge of our in house experience and industry experts.



We provide a full range of electrochemical and coupon weight loss laboratory techniques, both under ambient and elevated pressure conditions. We also provide application -specific testing.

Electrochemical screening testing:

- LPR bubble tests
- Higher shear RCE testing
- HPHT LPR tests
- HPHT RCE tests

Weight loss tests:

- Bubble tests
- Ambient & HPHT rotating cage coupon weight loss tests
- Rotating wheel tests
- Material compatibility tests

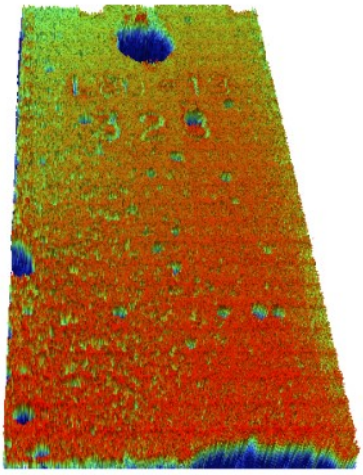
Application-specific tests:

- Inhibitor portioning
- Film persistence
- Jet impingement
- Under deposit corrosion
- Artificial pitting
- Preferential weld corrosion
- Volatile corrosion inhibitor content

Specialised Services

Scaled Solutions also offer specialised services which include jet impingement, under-deposit corrosion and top-of-the-line corrosion. These techniques are accompanied by the ability to conduct optical, 3D profilometry, scanning electron microscopy and pit depth measurements for pitting analysis.

Related testing including foaming and emulsion tendency, production chemical interactions, thermal ageing and chemical and materials compatibility testing are also available. Testing is offered under sweet (CO_2) and sour (H_2S) conditions.





Reliable Corrosion Testing supported by cutting-edge technology

Organic Testing

Asphaltenes, paraffin/wax and calcium naphthenates are major flow assurance challenges in many fields, and will continue to grow in importance as the number of more challenging crudes produced increases. Likewise, the formation of stable emulsions is problematic for many of our clients, leading to poor oil/water quality and in some cases fouling of topsides equipment with heavy sludges. Scaled Solutions has developed innovative equipment and testing methods to provide insight into the conditions under which organic deposits form, and to help mitigate against them.

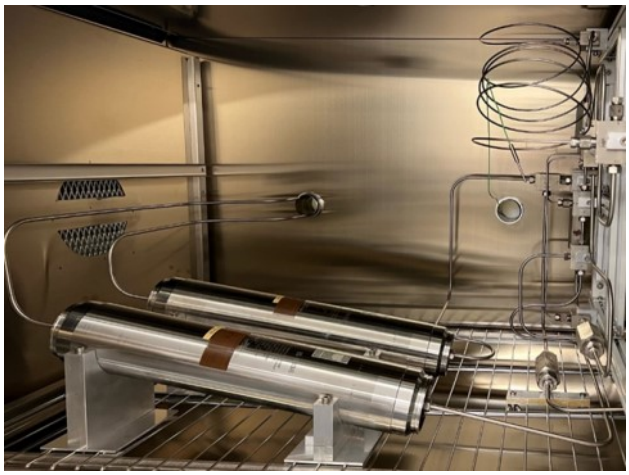
Asphaltenes

We offer a broad range of testing and consultancy for defining asphaltenes risk and assessing mitigation strategies including inhibitor/dispersant performance testing.

In addition to industry standard approaches, Scaled Solutions has pioneered the use of a HPHT flow rig (15,000 psi) for observing deposition from live fluid during isothermal depressurization — an 'AOP' for deposition.

We offer supportive testing including SARA analysis, asphaltene dispersancy testing (ADT), determination of asphaltene content by IP143, asphaltene onset by titration, hydrocarbon composition by GC and many more.

Our asphaltenes and wax testing can be carried out using live crude samples or 're-livened' dead crude.





Wax

Scaled Solutions offers services for assessing wax/paraffin risk and qualifying chemicals as part of a mitigation strategy. We work with live oil or recombined fluids to provide the most accurate assessment of the potential for wax deposition and/or gelling issues in production, processing, storage and export.

Our testing capabilities include WAT/WDT by CPM or DSC, wax content, pour point (upper and lower), live fluid WAT, wax composition (HTGC), restart pressure and yield stress, and EoS simulations to generate wax/paraffin precipitation curves.

We have developed a bespoke flow loop that enables assessment of pipeline restart pressures, WAT and deposition characteristics under conditions selected to represent those prevailing in the field. Tests are conducted at representative temperatures (-30 to +70 °C) and pressures (up to 5000 psi).

Separation / Naphthenates

We have designed a pressurized flow rig that has been used across numerous operators and regions to investigate the formation and inhibition of calcium naphthenate deposits, stable emulsions and persistent foams in the laboratory under conditions closely resembling those found in the field.

Our dynamic flow rigs have been validated in field studies and are routinely used to assist in new field risk assessments and the determination of field treatment designs. Our rigs are used to evaluate formation of naphthenates and stable emulsions under flowing conditions, performance of low-dose naphthenate inhibitors, demulsifiers and emulsion breakers as well as foaming potential and performance of antifoam/defoamer chemicals. Tests are conducted at temperatures (up to 100° C) and pressures (up to 100 barg) and can include the presence of CO_2 or other gases, known to be critical to accurately simulating field conditions.

Fluid Compatibility

We test the compatibility of oil blends using techniques including stability blending, P value, spot tests, NIR scattering and dynamic mixing in our flow rigs.

Modelling and Consultancy

We offer modelling using PVTsim Nova and ScaleChem as part of desktop studies for field review and supporting laboratory testing for asphaltenes, waxes, naphthenates, emulsions, hydrates and H_2S. We also offer review and modelling of mercury partitioning and transport.



Analysis

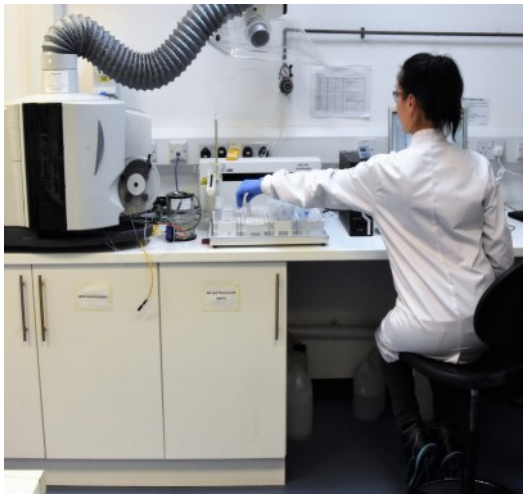
The diverse and dynamic production environments of the oil industry continually drive the demand for more effective scale, corrosion and separation control, while increasing environmental concerns push forward the development of environmentally friendly, preferably biodegradable production chemicals.

Scaled Solutions has extensive experience in the analysis of field water samples, production chemicals and oil samples utilising a variety of different techniques, including Inductively Coupled Plasma (ICP), Wet Chemical analysis, and Gas and Liquid chromatography. We offer method development & validation services carried out by highly experienced analysts.

Our qualified analysts use state of the art equipment to perform complex analysis and provide results that you can have confidence in.



The Analysis Team at Scaled Solutions have developed several methodologies for effective evaluation of production chemicals in sea water, produced water and formation water matrices



In addition to utilising standard industry methods, we offer method development & validation services which are performed by highly experienced analysts. We also offer analytical support services for routine brine, chemical and solids analysis, through a variety of methods, including:

- **Scanning Electron Microscopy (SEM)**
- **Compositional solids analysis by Energy Dispersive X-Ray Analysis (EDX)**
- **Optical Microscopy**
- **Topographic Microscopy (3D Microscopy)**
- **Viscometry & Rheometry (Brookfield II & Anton Paar)**
- **Karl Fisher (Water in Oil analysis)**
- **Infracal (Oil in Water analysis)**
- **Turbiscan (Emulsion & Solids Deposition)**
- **Asphaltene Dispersant Testing (ADT)**
- **Formation Damage evaluation by ICP**
- **Oil Analysis**
- **Fluorescence Spectroscopy**
- **Gas Chromatography (GC-MS, GC-FID, GC-FPD)**
- **High Pressure Liquid Chromatography (HPLC) with various detection methods**
- **Ion Chromatography**
- **Fourier Transform Infra-Red Spectroscopy (FTIR)**

Analytical development for scale inhibitors

Scaled Solutions have well-established techniques for conventional scale inhibitor analysis via ICP and wet-chemical methods. As part of the SWELL JIP series, new analytical techniques have been developed for analysing residual scale inhibitor concentrations, providing accurate, repeatable and reliable results. These methodologies focus on automated HPLC-based, solid-phase extraction and fluorescence based techniques, and analyse for the "active" scale inhibitor component, as opposed to other analysable moiety that can be detected by less focused techniques. These methods are used routinely in our laboratories.

Scaled Solutions have developed a range of methods for inhibitor analysis, including the use of Gel Permeation, Reversed Phase and Ion Chromatography.





Method development and validation

The analytical department of Scaled Solutions can offer practical solutions to the most challenging of testing conditions. We have extensive experience in developing procedures that optimise method accuracy, precision, robustness & sensitivity

Scaled Solutions offer technical expertise and consultancy on analytical methods for both onshore and offshore applications.

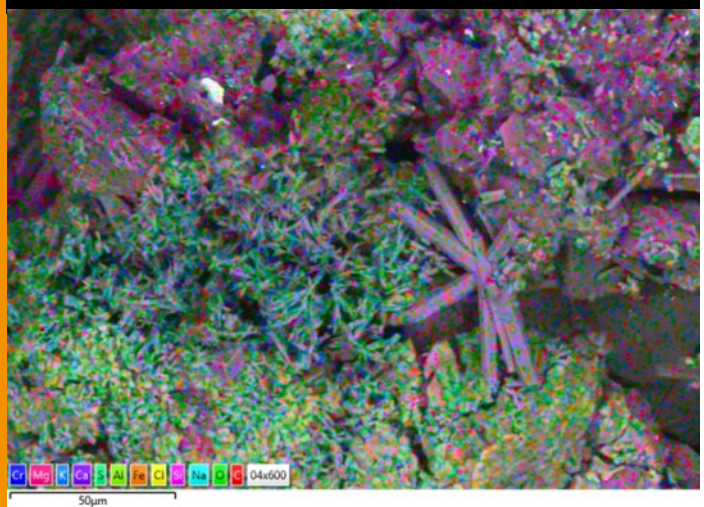
SEM/EDX

Our Hitachi Environmental SEMs have a wide range of applications including formation damage evaluation, compositional analysis and routine scale monitoring in field samples. We have recently upgraded our capabilities with a Hitachi 3400N SEM, capable of elemental mapping. The SEMs provide high quality imaging and elemental analysis through the energy-dispersive X-ray system, producing the cutting-edge quality imaging you need to analyse rock, scale samples, paper filters, metal filters, coupon surfaces, screens and more.

Our expert analysts can identify and differentiate between active and inactive scales on the basis of morphology and distribution, so you can be confident that your inhibitor is performing.



92800-1-3. Fossils in carbonate (above)



CaSO4 scale (Sulphur in green, bottom left) and CaCO3 scale (Carbon in red, top left, top right)

Joint Industry Projects (JIP)

Scaled Solutions has been involved with large Joint Industry Projects (JIPs) to tackle some of the industry's most pressing challenges. Currently, Scaled Solutions are engaged in the SWELL JIP.

SWELL is a JIP sponsored by multiple operators, vendors and service companies, to perform research and development aimed towards improving inorganic scale management and scale inhibitor treatments. The project is now in its sixth phase, SWELL Plus.

The scope of work has been expanded in order to support the transition to a low carbon future by extending existing research areas and investigating new topics to address gaps in current industry understanding.

One module of the JIP continues to investigate topics related to inorganic scale formation and inhibition continuing from the previous SWELL V project. This includes investigating the effect that kinetics and hydrodynamics have on the deposition and inhibition of scale, and providing best practice guidelines for scale inhibitor qualification.

A second module addresses challenges associated with low carbon technologies, focusing primarily on geological carbon storage (GCS). Many existing industry studies are theoretical/modelling in nature, whereas a key aspect of this project involves laboratory testing to add greater confidence to determining the magnitude of some of the expected issues associated with GCS and to evaluate the effectiveness of mitigation strategies.



Scaled Solutions

Research and Development

Research and Development is integral to Scaled Solutions. We have been involved in multiple joint industry projects for many years. In addition to that, we also run our own internal R&D programme with support from Scottish Enterprise.

As a community of scientists, we are passionate about discovering new things that help us to improve our understanding of oil and gas production. All of our R&D projects benefit from a multi-disciplinary team including in-house consultancy, modelling, engineering and analytical capabilities.

We also conduct a number of one-to-one R&D projects for our clients covering a wide range of topics including:

Chemical Delivery, High Pressure/High Shear Scale Formation, Naphthenates, Asphaltenes, Wax, Fluid Dynamics, Corrosion, Drilling Fluids, Advanced Analytical Techniques and EOR.



Scaled Solutions are currently engaged in a number of exciting activities as part of a large self-funded R&D project supported by a Scottish Enterprise Award. We are proud to be viewed as one of Scotland's most innovative companies, and have invested in cutting edge equipment and high calibre personnel to help us reach our R&D goals. Our current R&D activities are aimed at pushing the boundaries of what is possible in laboratory testing, going to higher pressures, temperatures and shear, exploring new analytical methods and procedures to ensure our testing is as field representative as possible.

Improving our understanding of oil and gas production...

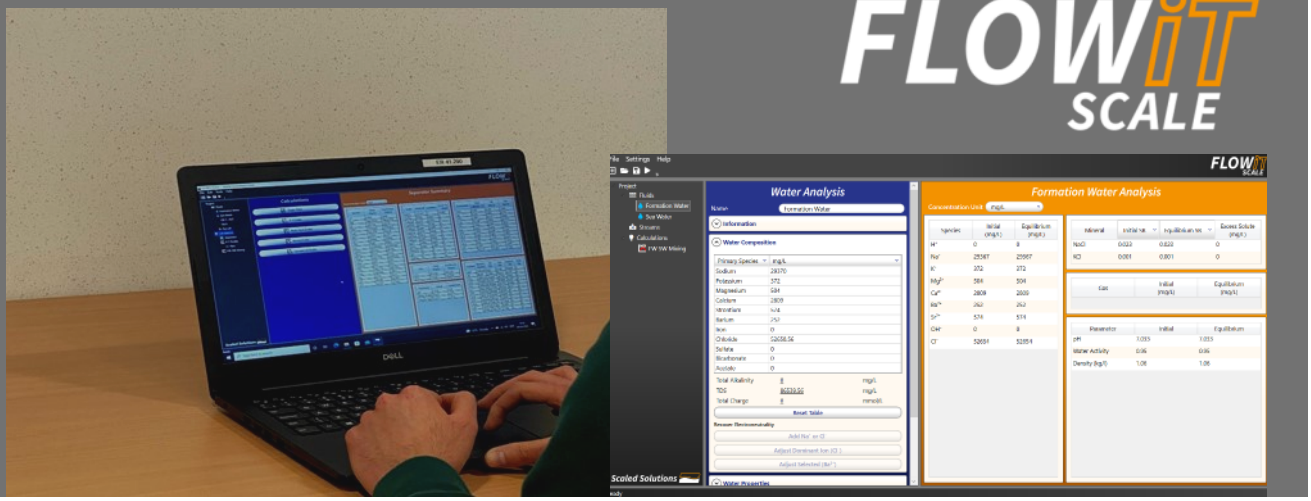


Internal R&D Programme Topics:

- **Pilot Rig**
- **Corrosion**
- **Asphaltenes, Waxes and Crude Analysis**
- **HP/HT Core Flood**
- **EOR Core Flood**
- **UHPHT Rig**
- **Stim Modelling**
- **Fluid Dynamics**
- **TRF Analysis**
- **Hydrogen Sulphide**

Software

FLOWiT SCALE



FlowiT Scale can calculate the mineral scaling potential throughout the production system from reservoir to topsides.

It can be used to model conventional oil or gas systems or more complex ones involving EOR or corrosion control.

Industry established thermodynamic model

Capabilities

- Modern, user-friendly, and adjustable graphical user interface
- Live mode allowing for real-time modelling
- Up to 6 water, 6 oil and 6 gas compositions can be included in a simulation
- Process modelling by generating streams, using up to 6 of them simultaneously in a calculation
- Large range of temperature and pressure including HP/HT with a temperature range of 0 – 300°C and pressure range of 1 – 1000 bar
- Mineral scaling calculated for common carbonate and sulphate scales, halite and sulfides (iron, zinc and lead), as well as some less common scales
- Single or multiple temperature or pressure point calculations with up to 32 datapoints
- Accurate PVT, phase equilibria and chemical equilibria calculations
- Instant results visualisation and plotting incorporated in the interface

Now Includes Kinetic Predictions

- FlowiT Scale v2.0 is now available with new features
- Indicates scaling risk based on kinetic factors (temperature and hydrodynamics)
- Critical SR/SI values based on empirical data from laboratory testing and field cases

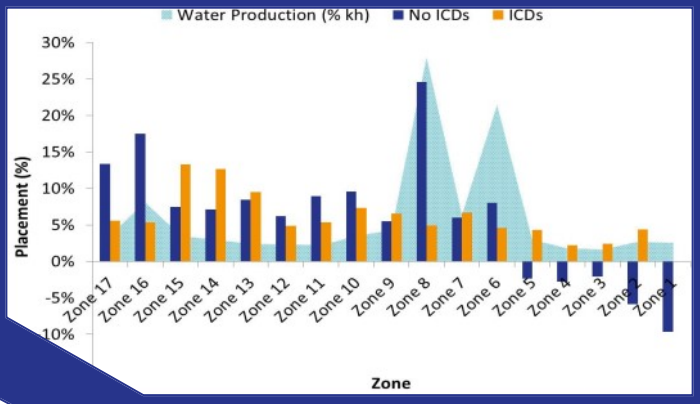


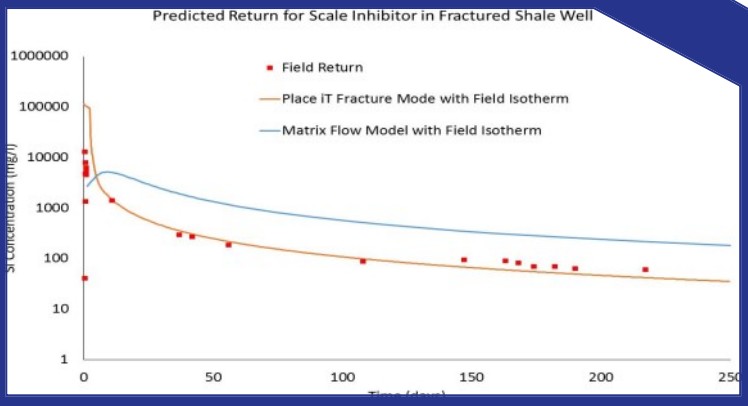
PLACEiT

Near wellbore chemical squeeze modelling software suite to predict chemical placement and treatment return/ lifetime and optimise treatment design

PlaceiT can be used for :

- Chemical Placement
- Scale Inhibitor Squeeze Treatments
- Corrosion Inhibitor Squeeze Treatments
- Core Flood Return Modelling





- Fractured Well Squeeze Treatments
- Staged Diversion Treatments
- Acid Stimulation Treatments
- Skin Factor Modelling
- Wellbore Temperature Modelling

PlaceiT Fracture has been developed specifically for unconventional hydraulically fractured wells.

PlaceiT ICD offers the industry a rapid-calculation tool which can aid the user's evaluation of the impact of ICD placement on inflow/outflow rates during well treatment and production stages.

PlaceiT Stim near wellbore stimulation modelling software. Predicts treatment placement, permeability/porosity and skin change following a stimulation job.

Scaled Solutions

Modelling

Near-wellbore fluid modelling is often required to assist in predicting chemical placement and creating well-by-well customised squeeze designs. This represents a particularly challenging problem when complex wells (multizones, crossflow, pressure contrast, presence of fractures etc.) are involved. At Scaled Solutions, in-house near-wellbore modelling is used to determine squeeze treatment placement, match field return data and predict scale inhibitor return profiles for simple and complex wells. It can also be used for core flood modelling and automated isotherm derivation. Our PlaceiT near wellbore chemical placement simulator was developed in-house through a succession of Joint Industry Projects, and is in widespread use across the industry to simulate and optimise treatment designs.

In conjunction with field review and consultancy services, we routinely carry out scale prediction modelling to give a better understanding of current or future scale issues in your wells using our state of the art software, FlowiT Scale.



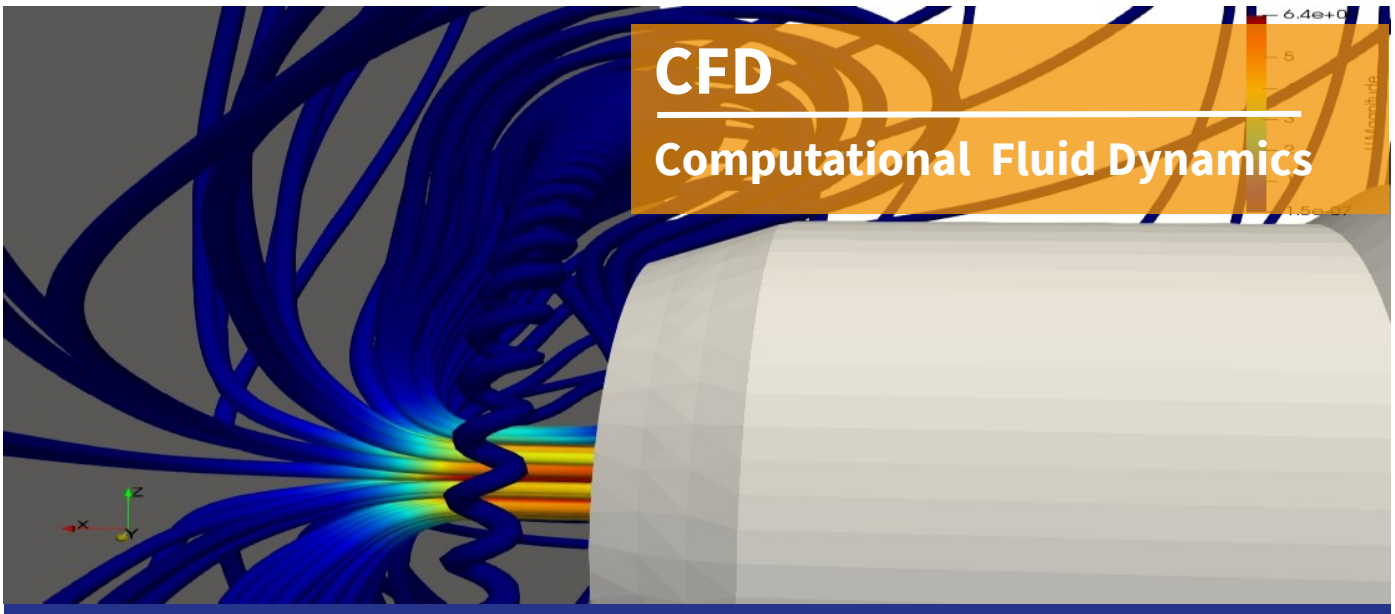
SolveiT Analyzer is a small, portable unit that uses a technique called time resolved fluorescence (TRF) to detect chemicals, such as scale inhibitors, down to parts per million (ppm) levels.

Used in conjunction with SolveiT Analyzer Test Kits, it provides a simple, easy-to-use method that can be applied in the field to monitor and optimise treatment concentrations in produced water without the need for chemical tagging.

SOLVEiT ANALYZER

Rapid, onsite analysis of oilfield chemicals in produced water samples

- Compact, portable device
- Simple procedure and software
- Rapid accurate analysis
- Measure residual scale inhibitor concentrations in the field to 1 ppm
- Polymer, phosphonate and phosphate ester inhibitors
- Tolerant to iron and high salinity
- Use in the laboratory for rapid analysis of core flood tests



CFD

Computational Fluid Dynamics

Computational fluid dynamics (CFD) is the study of flow regimes in a system. Pressures, velocities, viscosities and many more flow properties can be obtained and correlated to physical observations. Scaled Solutions uses CFD modelling to modify laboratory test apparatus and then upscale to field conditions to ensure the flow regimes are consistent.

Understanding how fluid flow regimes affect corrosion and scaling processes is of critical importance to ensure that the appropriate laboratory test methods are used to achieve field representative results.

Engineering

Scaled Solutions design and build all of the test rigs used in their laboratories, from routine testing rigs such as dynamic tube-blocking and core flood rigs, to complex highly innovative R&D rigs for specific projects. All of the rigs we make can be custom-built, tailored to customers' needs and made to order.

Our designs have been rigorously tested within our own laboratories. All of our rig-building projects include the following additional benefits:

- Equipment fully tested and commissioned (up to maximum pressure and temperature)
- Onsite setup and installation by our own trained Engineers
- One years warranty



We also offer a number of other products and bespoke rig setups, including Gas Lift Rigs, Product Stability Rigs, High Pressure Cells, Dual Purpose Rigs and Compatibility Test Apparatus. We are able to build Client Customised Designs and Customised Software Controls to suit your needs.

Buy your laboratory equipment from the people who use it, day-in, day out!



Dynamic Scale Rig

The dynamic scale rig allows for dynamic scale testing to be carried out following quick and straightforward protocols. Differential pressure is measured independently across the scaling coil and inline filter, allowing for investigation of different scaling mechanisms.

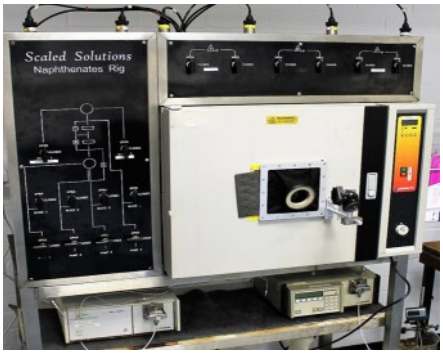
Dynamic Naphthenate Deposit and Emulsion Rigs

The dynamic naphthenate deposit rigs have been designed and fabricated in-house within Scaled Solutions and give a new and more realistic approach to standard naphthenate bottle testing.

Core Flood Rig

Scaled Solutions has been building and using core flood rigs for over twenty years. During that time, we've refined and improved our designs to give you a streamlined, reliable and intuitive product that will allow you to achieve excellent test quality in the laboratory.







Service Contracts

Following on from the initial warranty, which is included in the cost of the rig, Scaled Solutions also offer our customers the option of an additional service contract. This service contract includes the facility to loan equipment in the unlikely event of a fault developing, and also re-plumbing the 'hot' tubing of the rig after a specific period.

Corrosion Kits

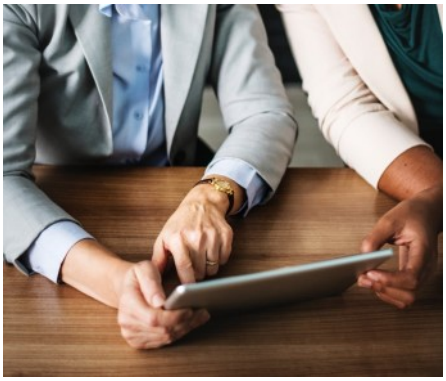
Scaled Solutions supplies a variety of corrosion equipment to suit your needs. We can advise on what kind of equipment you will need to perform your tests, and help you set up your corrosion testing apparatus.

Training and Support

When you buy new equipment, you want to be able to start using it straight away. We recognise this, and so we offer 5 or 10 day training options as standard or you can ask us about individually tailored training courses to gain an in-depth knowledge of the science and theory behind the equipment.







Consultancy & Training



Technical experts you can trust

In addition to providing consultancy and training in support of our laboratory studies, Scaled Solutions also offer a wide range of external consultancy services and training courses to our clients. Our training courses are provided by experienced laboratory staff, technical experts and senior internal consultants from a variety of disciplines, each having over 20 years' experience in the Operations and Service sectors. Scaled Solutions also offer modelling services for full-field and near-wellbore simulations.



Each year, we hold bespoke training courses around the world bringing together our senior experts to present Scaled Solutions' internationally-recognised Production Chemistry Course.

Look out for updates on our course dates and locations on our website and social media accounts.

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