LBBC BASKERVILLE

Corrosion testing made easy

Future Corrosion Testing Developments

At LBBC Baskerville, our vision is to provide products that will help to enhance corrosion control, prediction and management in order to improve on the safe and efficient recovery of hydrocarbons. With the ultimate goal of playing a role in preventing catastrophic corrosion related failures across the industry.

Working in partnership with the University of Leeds, specifically a team of corrosion experts lead by Professor Anne Neville; LBBC Baskerville are continuously developing new products that can help replicate field conditions realistically with the aim of improving corrosion testing, repeatability and industry standards.

Products in the pipeline

- Severe service HPHT chemically inert autoclave with electrochemistry
- HPHT autoclave with electrochemistry in dynamic conditions in the presence of H_2S
- Fully automated system with in-line inhibitor injection, brine sampling and the ability to monitor the brine chemistry for the duration of the test (O_2 monitoring, pH monitoring, Fe^{2+} concentration monitoring)
- Coupon/electrode retractable system to remove/insert coupons periodically to eliminate pre/post test corrosion and to analyse corrosion mechanisms over time without performing multiple tests
- Constant chemistry autoclave system featuring all of above

Advanced autoclave systems to incorporate:

- Dynamic loading devices (stress corrosion cracking)
- *In-situ* tribometer (Tribo-corrosion)
- *In-situ* jet impingement (erosion-corrosion)
- Flow loop (flow-induced corrosion)
- XRD/Raman flow cells (*in-situ* corrosion product formation)

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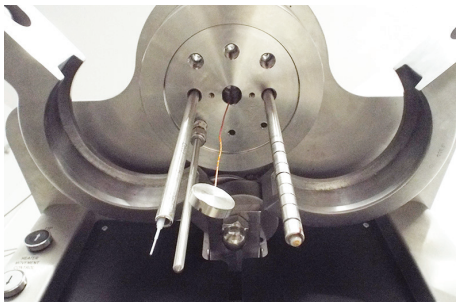
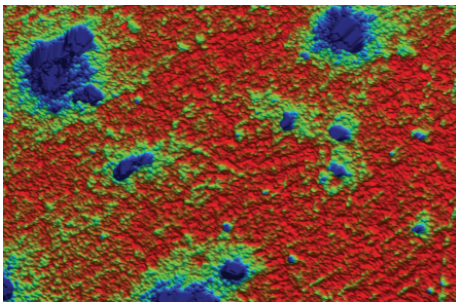
Linking Laboratory Corrosion Testing to Field Applications

Realistic Field Conditions	Improving Testing Methods & Equipment	Corrosion Mechanisms Simulated
Extreme Environments • Pressure and temperature conditions • Highly corrosive (CO_2/H_2S, HCl, Acetic Acid)	**Advanced CRAs and Liners:** C276, Tantalum, PTFE, glass lined	**CO_2 Corrosion** • General corrosion • Localised corrosion (pitting, Ccevice corrosion) • Corrosion product formation: $FeCO_3$, Fe_3O_4, $Fe_2(OH_2)CO_3$
Corrosive Fluid Chemistry, Properties & Variance: • Constant chemistry (pH, Fe^{2+}, SR) • Accurate CO_2/H_2S partial pressures • O_2 concentration (<50 ppb) • Seawater composition (% water cut) • Presence of sand • Inhibitor dosing	**Controlling chemistry:** Online monitoring, filtration system, injection/dosing system, larger dual autoclave **Sampling system:** Solution analysis ***In-situ* sensors:** pH, O_2 content, working/counter/reference electrodes	**H_2S Corrosion** • Stress corrosion cracking • Sulfide stress corrosion cracking • Localised corrosion (pitting, crevice corrosion) • Hydrogen permeation • Corrosion product formation: FeS
Properties/Condition of Corroding Surface: • Corrosion rate and mechanisms • Corrosion product formation • Properties of the surface • Exposure times	**Coupon configurations:** Weight loss, working electrode, micro/multiple electrodes, crevice formers, stressed coupons, dynamic loading, *in-situ* tribometer, retractable coupons/electrodes, Devanathan cell **Real-time Corrosion Product Analysis:** Flow cell for *in-situ* XRD, window for digital image correlation **Control of exposure time:** Retractable/insertable coupon/electrode system, dual autoclave, internal flow gasket	**Preferential Weld Corrosion** • Localised corrosion (pitting, crevice corrosion) • Intergranular corrosion • Galvanic corrosion **Flow-induced Corrosion** **Tribo-Corrosion** **Erosion-Corrosion** **Top-of-the-line Corrosion**
Simulating Flow Regimes/ Hydrodynamics: • Stagnant areas (bottom and top of the line) • Reynolds Number (laminar/turbulent flow) • Wall shear stress	**Controlled Flow:** Rotating cylinder/disk electrode, flow loop, *in-situ* jet impingement	

APPLICATION → **AUTOCLAVE** → **RESULT**





Get in touch - we understand your testing needs!

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