

Core Competencies

Our success relies on finding chemical solutions to difficult problems.

Below is listed problem areas where we believe we have significant technical and/or commercial advantages.

Stimulation – HCL is 100+ years old technology with a documented 32% failure rate. **HDC Mk II™** is an advanced mixture of chelating agents, catalysts, and reaction accelerators that dissolves CaCO₃, **barite**, and other sulphate compounds. It is environmentally benign and safe to handle. Average increases in production with one major operator in Malaysia has been over 600%. It simply performs better than acid. We have several SPE papers written by operators about successful stimulation jobs, and related, along with many case histories from all over the world.

SCP, Pressured Annuli, leaking packers and casing, even grouting - Liquid Bridge Plug is an epoxy resin that is immiscible in both oil and water. It can be weighted up with barite. As a result, we can deploy the product by gravity drop from the surface to rest upon the problem leakage, or traditionally pump it to the problem area. Liquid Bridge Plug can be both accelerated and retarded. It has 200 times the tensile strength, 4 times the compressive strength and 4 times the bonding strength of cement. Plus it is thinner and does not shrink as it sets up. It solves a wide variety of problems.

Differential Sticking in an SBM/OBM – When stuck in an SBM/OBM there is little to no effective chemical technique to free the pipe. **HDC Mk II™** dissolves the filtercake, i.e., the barite in the filtercake along with any CaCO₃, and also dehydrates and shrinks any clays that may be in it. We have SPE papers and many successful jobs.

Cement Spacer that stops losses – Ultra Spacer performs as a spacer cleaning the casing and filtercake while also preventing losses to the formation thus ensuring a successful cement job. Surprisingly, it is unique in this application.

Descaling – including ESP's and other surface and subsurface targets. We have several descaling products including advanced chelants. They are effective for a variety of scales, are non-corrosive, temperature tolerant, and safe to handle. **Pyrosol ES** is a very effective **Iron Sulphide scale dissolver**, typically a difficult scale to dissolve. Another example is when operators encounter scaled up or overloaded ESP's they are simply told to replace them, a very expensive procedure. We have found by simply analysing and defining the plugging compounds, we can dissolve the problem compounds in situ with just a mixing tank and pump, a quick, effective, and cost-effective operation. Our lab work determines the products required.

Wax, Scale, and Corrosion Inhibition in Wells and Pipelines – **PMI-107** is in a class of one, a multi-functional product for inhibiting scale, wax, and corrosion. It does this two ways. Firstly, by coating the metal surfaces preventing scale, wax, and

WellTech

corrosion from building up in the first place. Secondly, it is amphiphilic so interferes with wax precipitation and scale precipitation in both phases. **PMI-107** also keeps the phases, water and oil, separate, acting as a DRA, PPD, and promoting easy separation. A variant called **PMI-107FA** also includes a very unique and effective H₂S scavenger.

Wax, Asphaltene, and Scale Dissolving in Wells and Pipelines – we have a variety of wax, asphaltene, and scale dissolvers to select from. **Pyrosol ES** is a very effective iron sulphide and iron sulphate dissolver. **OrangeWorks**, **PowerPickle**, and **PMI-107** are effective wax and/or asphaltene dissolvers. **PentaFlow** has been used as a combination wax and CaCO₃ scale dissolver.

HDC Mk II™, and **PentaFlow** are just a few of our many hydrocarbon residue and/or scale dissolvers. We have other 3rd party manufacturers with products that we also use. Our goal is to pick the best product available to us for the application, not to sell a specific brand.

Water or Gas Shut-off – with **Liquid Bridge Plug** and/or **Poly Plug**, shut off treatments are a core business. Both products have multiple patents. We have many case histories from around the world on successful WSO work.

ICS Drilling Fluids System (formerly known as the Aphron System) - The Invasion Control System (ICS) is a unique, effective system used to prevent loss circulation and avoid differentially stuck pipe. It is stick proof AND stops all losses. We cannot emphasize the uniqueness of this system enough. It is water based containing KCL. It is completely solids free (unless barite added). The fluid loss is controlled by highly emulsified air bubbles. This allows the fluid to establish a tight seal across formations regardless of the overbalance in the annulus, allowing drillers to penetrate multiple pressure zones simultaneously without incurring fluid losses, stuck pipe, kicks or poor hole cleaning. We have gone as high as 9.0 ppg overbalance in a previously problematic well without any issues with losses or differential sticking.

PNA – Plug and Abandon wells. **Liquid Bridge Plug** or **Ultra Set** are both stronger than cement and are good to use to set plugs with plugging and abandoning wells.

Sealing leaking wellheads – We have both types of wellhead sealants, temperature activated and differential pressure activated, **Well Bond** and **Well Bond II**, which enables us to seal both leaking wellheads and hanger voids.

We also have several candidates for IOR and EOR. Besides all the above, we have other areas of activity such as **treating sludges**, **cleaning out tanks**, **dissolving SRB's** which can inhibit production, **treating damaged injection wells**.

Another area is very effective well bore clean-up chemicals, WBCU, a core product line.

Many of these jobs are simply bullheaded, i.e., rigless, saving the time and expense of a rig or CT unit.