



Distributed Temperature & Acoustic Sensing

Qteq's FibreTraq distributed temperature sensing (DTS) and distributed acoustic sensing (DAS) systems make use of optical fibre as both a sensing element and as a conduit for transmitting optical measurements.

As a sensing element, exposure to temperature and acoustic energy induces micro strain in optical fibre, with light transmitted down the fibre used to detect this micro strain at length intervals determined by a surface interrogation unit.

Distributed fibre optic monitoring technology offers high spatial and temporal profiling over large surfaces, long lengths and at locations where conventional sensing is not applicable nor cost-effective. This means FibreTraq DAS and DTS technology offers an unprecedented variety of applications, spanning all georesource sectors, profiling surfaces and downhole processes, equipment and plant, at scales varying from centimetres to kilometres, and at high spatial resolution.

In downhole applications, the exceptional sensitivity and repeatability of DAS and DTS profiles also enables this technology to accurately detect and trend subtle changes in reservoir and well conditions over time.

With no fragile nor temperature-sensitive downhole componentry required, FibreTraq optical distributed sensing systems are also extremely robust and provide long-term reliability.

As such, our technology can be deployed for life-of-well applications, from initial drilling through to well abandonment, representing an exceptionally cost-effective investment in terms of well integrity, flow and reservoir assurance. Optical fibres can also be encapsulated with an insulated electrical conductor inside a single armour, enabling ResTraq point pressure and temperature monitoring systems to be integrated with FibreTraq distributed and multi-point sensing capabilities.

Just as we offer a wide range of pressure sensor types for use with our ResTraq platform, our FibreTraq optical sensing systems are compatible with a variety of single mode (SM) and graded index multimode (MM) fibres to suit in-well conditions and specific applications. In standalone applications, we design and customise our various fibre optic armoured cable constructions to suit specific downhole environments.

Qteq's FibreTraq systems can be further customised for either permanent deployment behind casing, or retrievable deployment on production tubing or suspended inside tubing.

Features and Benefits

- Customised to meet client specific requirements for temperature and acoustic sensing.
- Can be permanently deployed behind casing or as fully retrievable systems on tubing.
- Absence of downhole electronics improves system reliability, and life-of-well longevity.
- Wide range of applications and answer products.

Applications

- Cement bond evaluation.
- Multi-stage hydraulic fracture stimulation effectiveness.
- Fracture fluid flowback profiles.
- Production and injection flow profiles.
- Identify zones for re-stimulation or shut-off.
- Gas lift optimisation.
- Micro-channelling behind casing.
- Casing or tubing leak detection.
- Post-well abandonment integrity.

Key Components

Heavy Duty Protectors

TSS 010001

Provide means of protecting the Fibre Turn Around Sub, TEF and Splices during deployment and during well production/injection when deployed on tubing.

Fibre Turn Around Sub

TSS 010002

Manufactured from high grade stainless steel materials, designed to withstand harsh downhole chemical and pressure environments. Pressure sealing is achieved through use of metal-to-metal seals and elastomeric backup seals. Primary connections are pressure testable to well and client specific requirements.

Fibre Wellhead Outlet (FWHO) 10K

TSS 010003

Designed to provide a rugged and safe exit for the TEF through the wellhead, while providing pressure testable well integrity. The FWHO provides means to splice TEF to surface fibre cable through a secondary pressure barrier, ensuring pressure control is maintained in the unlikely event of a breach in the downhole TEF.

Tubing Encapsulated Fibre (TEF)

TSS 010004

Provides reliable, high performance distributed temperature and acoustic measurements from surface to well total depth. The TEF is designed to provide maximum protection through a tube-in-tube construction, maintaining pressure isolation to the well environment, and can be deployed both on the outside of casing and/or production tubing.

DAS and DTS Fibre Interrogator

TSS 010005

Provides the means to sample the downhole fibres, both for temperature and acoustic profiles, with sampling frequency, spatial and signal resolution programmed to customer specific needs and requirements. The Interrogation unit can be installed onsite permanently or be used to conduct periodic "drive-by" surveys.