

SmarTest™ System

A cost effective, total solution for gathering dynamic reservoir data without flaring

SmarTest™ is a state-of-the-art telemetry operated testing assembly that improves well evaluation by integrating existing drillstem testing (DST) technology with recent developments in Down Hole Tool and sampling technologies.

The system is designed for openhole applications but can be readily modified to run in cased hole applications. SmarTest provides operators with the ability to collect reservoir data and fluid samples in a lower risk environment than traditional openhole testing. The result is a total solution for dynamic production well testing that makes exploration activities more environmentally friendly and cost effective.

Using the SmarTest system allows:

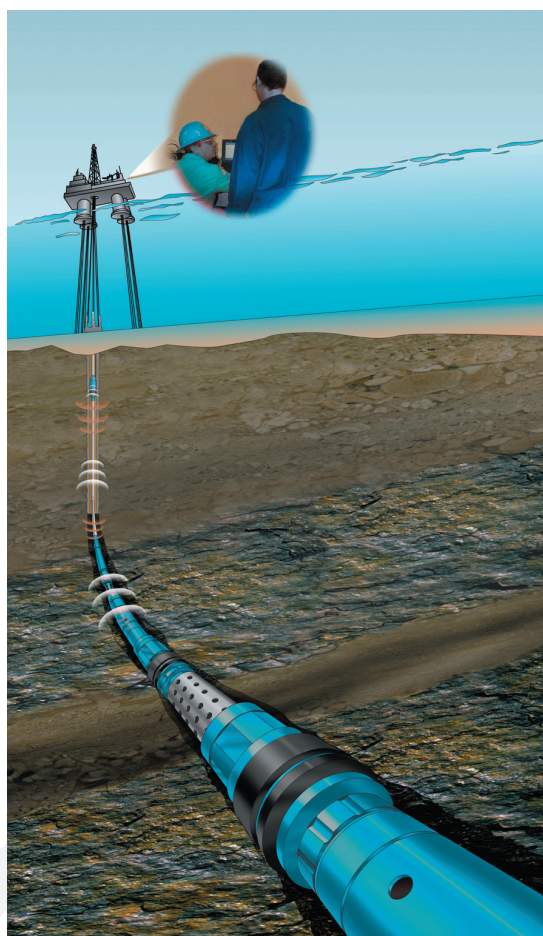
- Testing reservoirs using closed chamber techniques to calculate:
 - permeability
 - skin
 - productivity index
 - reservoir pressure
- Recording real-time pressure and temperature
- Measuring fluid flow rates
- Constantly measuring and recording real time fluid properties e.g. density, viscosity and conductivity
- Retrieve high-quality Single Phase PVT samples from wells
- Ability to test multiple zones during a single RIH

Benefits:

Providing quality reservoir data at a fraction of the cost compared to DST
Minimizes surface equipment
Provides greater value and results than available with Wireline Formation Testing (WFT)
Tests multiple zones in same run
Requires NO flaring as hydrocarbons are never brought to service
Reduces risk of operational downtime by using wireless, two-way data transmission.
Captures bulk samples that can be as large as the internal volume of the workstring
Gathers better dynamic reservoir information (than WFT) via a greater radius of investigation

Features:

For openhole or cased hole applications
Real-time acoustic two-way data transmission
Pressure compensated single-phase samplers
Telemetry downhole tools
Tool position/status feedback
Downhole fluid identification by conductivity, permittivity, density, viscosity, and pH
Multiple zone testing in a single RIH
Large volume bulk fluid sample
Closed flow chamber with fluid interface device (PIG)
Significant reduction in well costs



SmarTest™ System

A cost effective, total solution for gathering dynamic reservoir data without flaring

All the value and results of conventional drillstem testing (DST) at a fraction of the cost

The verification of: Hydrocarbon reserves, fluid properties and behaviour obtained from conventional drillstem testing can yield the accurate data required for optimised oil & gas field development. However, the operational cost is high. The Smartest system delivers the same accurate data but at significantly reduced cost.

A major advantage over wireline formation testing (WFT)

The data obtainable using WFT is limited in both quantity and quality since it only reflects what is happening in the near well bore. Because the SmarTest system allows operators to flow greater volumes of reservoir fluids, more representative fluid samples and data of increased accuracy can be obtained due to the larger radius of investigation. As a result SmarTest can yield more information than conventional WFT.

Technical Specifications:		Comparison of Testing Methods:		
Open Hole Size	8" - 12"	Objectives	WFT	SmarTest DST
Min. Casing	7" - 9 ⁵ / ₈ "	Initial Reservoir Pressure	√	√ √
Max. Pressure	15,000 psi	Permeability	√ ₁	√ √
Max. Temperature	302°F / 150°C	Representative Single-Phase Samples	√ ₁	√ √
Produced Volume	18bbl /3m ³	Skin Factor		√ √
Flow Chamber	5" or 7"	Productivity Index		√ √
Ideal Height of Pay Zone	3 ft	Atmospheric Bulk Samples		√ √
Pressure/Temperature gauges	no limit	Radius Of Investigation Past Damaged Zone		√ √
		Reservoir Limits Test		√
Fluid Samples:		Typical No. of Rig Days, 1 Zone	2	3 7
4 x PVT Quality (single phase)	4 x 540 cc	Typical No. of Rig Days, 2 Zones		5 17
Large Volume Bulk Sample	50 l			
Fluid ID measurements:				
Density	0.3 - 1.35 g/cc			
Viscosity	0.2-100 cP			
Permittivity	1-10			
Conductivity	0.01 - 20 S/m			
pH	3 - 11 pH			
Pressure	0 - 1034 barg			
Temperature	0 - 175°C			
Down Hole Gas Chromatograph (under development):				
H ₂ S	10ppm IDL			
CO ₂	50ppm IDL			
C1-C5	2% relative uncertainty			
Pressure	100-1000 barg			
Temperature	0-165°C			
GOR	100 - infinite			

1) Although WFT is capable of meeting these objectives, under some circumstances these results are not always guaranteed.