X-Dipole Logging Tool (XDLT)

GOWell's X-Dipole Logging Tool is an array acoustic tool with monopole, dipole and cross-dipole acquisition capabilities. The tool is essential for collecting a full range of acoustic datasets, which contribute to petrophysical evaluation and geophysical applications.

Receiver

Transmitter

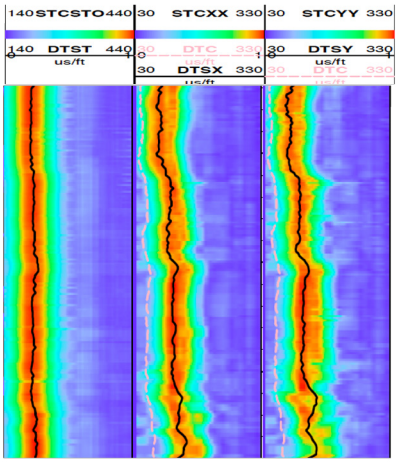
Isolator Electronics

DESCRIPTION

The X-Dipole Sonic Tool is composed of four (4) main parts:

1) Electronics instrument
2) Receiver section
3) Acoustic isolator
4) Transmitter section

The tool has four (4) separate broadband acoustic transmitters—one monopole, two dipole and one stoneley transmitter. The monopole output is optimized for compressional and refracted shear measurements; whereas, the stoneley transmiter is a unique design optimized for low frequency stoneley excitation. The two dipole transmitters are co-located and optimized to maximize output energy for slow, soft rock formations.



Real-Time Quality Control Plot from 8-1/2" Open-Hole Log

APPLICATIONS

- Gas zone detection (VP/vs)
- Fracture identification (Stoneley)
- Permeability estimation (Stoneley)
- Formation Anisothropy assessment
- Formation porosity
- Measurement of compressional and shear waves in open or cased-hole
- Synthetic Seismograms
- Lithology and clay identification

FEATURES

- Combinable with other Gallop tools
- Records the waveform of the reflected value from formations
- By measuring sonic slowness, formation porosity can be obtained
- Rock anisothropy analysis can be achieved (full waveform mode and Azimuth required)
- Transmitter section assembled with peek sleeves for increased reliability and lower maintenance required
- Ten independently linked assemblies in the isolator section are included to better attenuate the tool body signal, maintain alignment and provide increased tension & compressive strength
- Three programmable operating modes available:
  Mode 1: Fast Logging
  Mode 2: Non-anisothropy
  Mode 3: Full waveform

SPECIFICATIONS

	XDLT - X-Dipole Logging Tool
General Specs	
Maximum Pressure	20,000 PSI (137 Mpa)
Maximum Temperature	350 °F (175°C) - 4 hours
Maximum Hole Size	17.91 in. (454.91 mm)
Minimum Hole Size	4.49 in. (114.05 mm)
Diameter	3.858 in. (98 mm)
Length	36.42 ft. (11.1008 m)
Weight	888 lbs (403 kg)
Receivers	8 levels spaced at 0.5 feet, 4 receivers/level 32 rx, 3 tx (1 monopole, 2 dipole)
Acquisition Mode	
Typical Logging Speed (Q-Combo) @ 4spf	
*Single Inline Dipole	75 ft/min (22.8 m/min)
*Dual Inline Dipole	62.5 ft/min (19 m/min)
**Full Dipole	34 ft/min (10.3 m/min)
Borehole Conditions	
Borehole Fluids	Any liquid
Tool Position	Centralized
Hardware Features	
Voltage	220 Vac, 50 Hz
Current	200 mA
Source Type	3.7 KHz/14KHz
Working Mode	High Speed, Non-homogeneity, full mode
Sensor Type	Piezoelectric Ceramic Transducer
Sampling Rate	10, 20, 40 samples/m selectable
Measurement	
Principle	Sonic Slowness and Homogeneity Analysis
Minimum	130 us/min
Maximum	3300 us/m
Vertical Resolution	6 in. (15.24 cm)
Depth of Investigation	2 in.
Accuracy	± 2 us/m
Primary Curves	Delta-T Compressional, Shear, Stoneley

*Far Monopole acquired in all modes

**Additionally a near monopole is acquired for enhanced compressional slowness in hard rock environments

Specifications are subject to change as tools are constantly being improved