

ArtFusion

Array Resistivity Tool



Array Resistivity Tool		ArtFusion 475				ArtFusion 675				ArtFusion 825			
General Specifications													
LWD Propagation Resistivity Tool													
Drill Collar Nominal OD		4.75 in (API)				6.75 in (API)				8.25 in (API)			
Max. Diameter		5.375 in				7.35 in				8.75 in			
Hole Size Range		5.75 in to 6.75 in				8.5 in to 9.875 in				10.5 in to 14.875 in			
Tool Length		192 in.				192 in.				192 in.			
Tool Weight		1200 lbm				1800 lbm				2500 lbm			
Max. Dogleg Severity		15°/100 ft Rotating 30°/100 ft Sliding				8°/100 ft Rotating 16°/100 ft Sliding				7°/100 ft Rotating 14°/100 ft Sliding			
Max. Temperature		150°C (300°F) 175°C (350°F) option				150°C (300°F) 175°C (350°F) option				150°C (300°F) 175°C (350°F) option			
Max. Pressure		20,000 psi, 25,000 psi option				20,000 psi, 25,000 psi option				20,000 psi			
Max. Flow Rate		400 galUS/min				800 galUS/min				1200 galUS/min			
Mud Type		WBM/OBM/SOBM											
Power Option		External Battery /Turbine											
Memory		More than 200 hrs (continuously)											
Resistivity Measurement Specifications													
Operating Frequencies		2MHz, 500 kHz											
Resistivity Range/Accuracy				Range		Accuracy		Range		Accuracy			
		2 MHz PS		0.1-60 ohm.m		+-2%		60-3000 ohm.m		+-0.3 mS/m			
		500 KHz PS		0.1-10 ohm.m		+-2%		10-100 ohm.m		+- 2 mS/m			
		2 MHz ATT		0.1-20 ohm.m		+-4%		20-50 ohm.m		+- 2 mS/m			
500 KHz ATT		0.1-5 ohm.m		+-5%		5-10 ohm.m		+- 10 mS/m					
Measurement Spacing		20 in		28 in		36 in		44 in		52 in			
Depth of Investigation	2 MHz	20" (PS)	38" (AT)	23" (PS)	43" (AT)	26" (PS)	48" (AT)	29" (PS)	53" (AT)	31" (PS)	58" (AT)		
	500 kHz	27" (PS)	59" (AT)	34" (PS)	63" (AT)	40" (PS)	67" (AT)	46" (PS)	70" (AT)	50" (PS)	73" (AT)		
Vertical Resolution	2 MHz	0.8' (PS)	2.0' (AT)	0.8' (PS)	2' (AT)	0.8' (PS)	2' (AT)	0.8' (PS)	2' (AT)	0.8' (PS)	2.0' (AT)		
	500 kHz	1.0' (PS)	3.0' (AT)	1.0' (PS)	3.5' (AT)	1.2' (PS)	3.5' (AT)	1.2' (PS)	3.5' (AT)	1.2' (PS)	3.5' (AT)		
Gamma Measurement Specifications													
Range		0 – 500 gAPI											
Vertical Resolution		10 in						10 in					

Application

- Accurate formation evaluation in all mud types
- Geological structure

Benefit

- More accurate reserve estimate in all mud types
- Optimize well placement
- Data while drilling

Features

- 20 borehole compensated propagation resistivity measurements allows for advanced environmental corrections providing true resistivity
- Gamma Ray images from Azimuthal Gamma Ray sensor
- Deepest DOI in industry



Accurate Formation Evaluation

Multiple measurements are required for petrophysical analysis to overcome the environmental errors associated to invasion, anisotropy, shoulder bed effects, OBM eccentricity, dielectric effects, mud resistivity in the wellbore and fractures.

A minimum of THREE resistivity curves are needed to enable inversion for mud invasion correction to get R_{xo} , R_i and most importantly R_t .

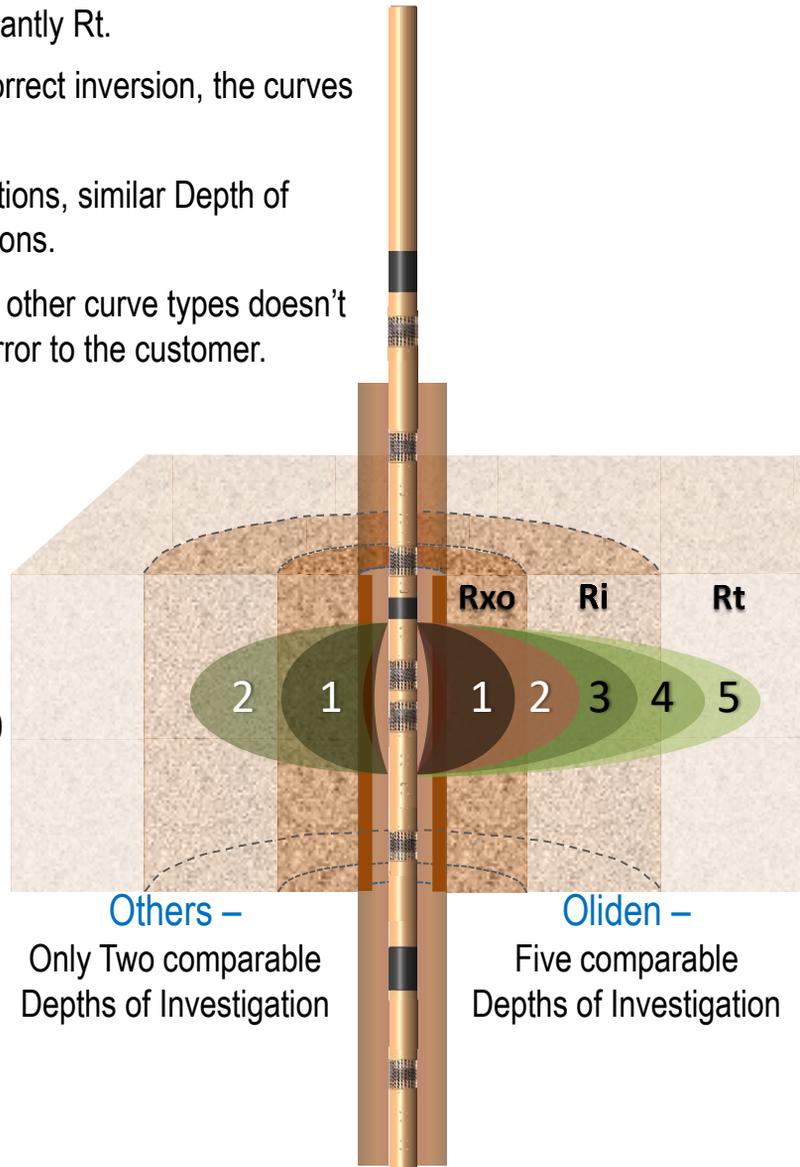
In order to be predictable and undergo correct inversion, the curves must be comparable to each other.

They must have the same response functions, similar Depth of Investigations and similar vertical resolutions.

Therefore mixing 2 MHz Phase Shift with other curve types doesn't allow accurate inversions and provides error to the customer.

Industry limitations

- 2MHz Attenuation measurements are only accurate to approx. < 50 ohm-m
- 2MHz Attenuation has much poorer vertical resolution than 2MHz Phase Shift.
- 400kHz only accurate to approx. < 10 ohm-m
- 400 KHz measurements have very large vertical resolution



Oliden solution

Oliden's ArtFusion and DartFusion tools each have FIVE 2MHz Phase-Shift measurements for accurate formation evaluation (20 curves in total).

- The five 2MHz Phase Shift measurements have high measurement range and high accuracy.
- The five 2 MHz Phase Shift measurements have excellent vertical resolution.
- Consistent and comparable measurements equates to accurate formation evaluation.
- With the capability to obtain accurate Formation Evaluation, savings can be made by elimination of wireline logging runs.