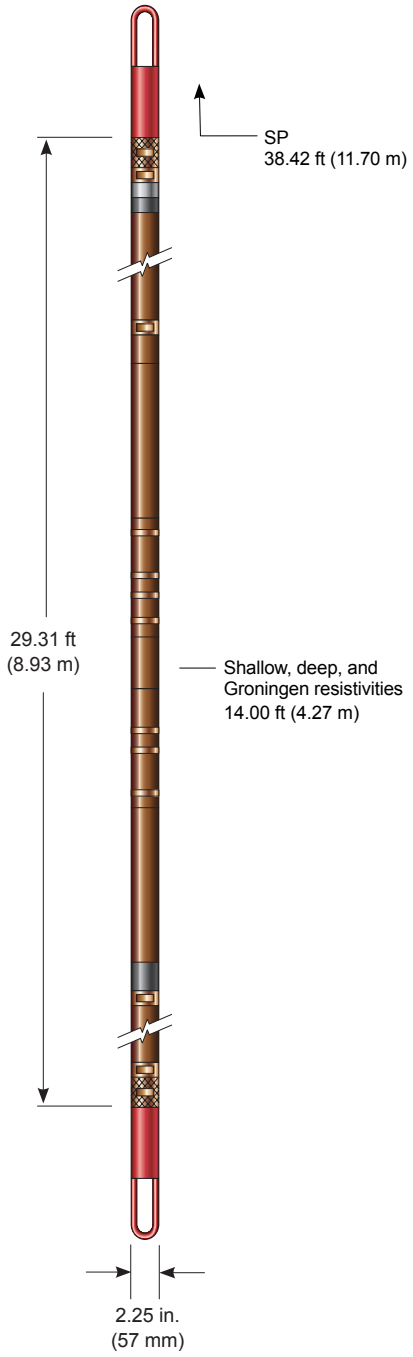
Compact™ Dual Laterolog (MDL) Tool

Weatherford's *Compact* dual laterolog (MDL) tool is the resistivity tool of choice in wells drilled in high-contrast, true formation resistivities (R_t) / mud resistivities (R_m) environments. The MDL tool provides individually optimized deep- and shallow-penetration curves that share a common 2-ft (0.6-m) vertical resolution. Optimized-electrode geometry and digital-measurement sequence control give the tool excellent environmental performance over a wide range of R_m and hole sizes and virtually eliminate electrode-polarization effects.

The voltage reference and simultaneous SP electrodes are incorporated into a stiff bridle at the top of the tool string to optimize reliability. The cableless logging variant enables the MDL to be run without a wireline.

The Groningen curve is used with the deep measurement to detect anomalous responses as the tool approaches nonconductive formations, such as salt caps.

The MDL tool is normally run with the microlaterolog (MMR) or microlog (MML) tool to determine the invaded-zone resistivity.



Applications

- Determining formation resistivity in conductive-mud environments
- Determining water saturation (S_w)
- Providing well-to-well correlation
- Identifying moveable fluids
- Identifying fluid contacts
- Creating an invasion profile to indicate permeability, when used with the flushed-zone resistivity (R_{xo}) MMR tool

Features, Advantages and Benefits

- The arrangement of the electrodes on the MDL tool detects the Groningen effect for quality control to provide accurate, real-time, deep-resistivity readings.
- The MDL can be run in combination with the microresistivity (MMR/MML) tool to obtain an independent, shallower measurement for improved accuracy in determining R_{xo} and R_t in complex invasion profiles.
- Data from the microresistivity (MMR) or the shallow-focused electric (MFE) tool can be used to significantly enhance the vertical resolution of the MDL to less than 1 ft (0.3 m) for improved thin-bed analysis and reserve estimates.
- The small diameter of the tool facilitates flexible deployment in wireline or memory mode to mitigate the risk of bridging events and reduce nonproductive time.

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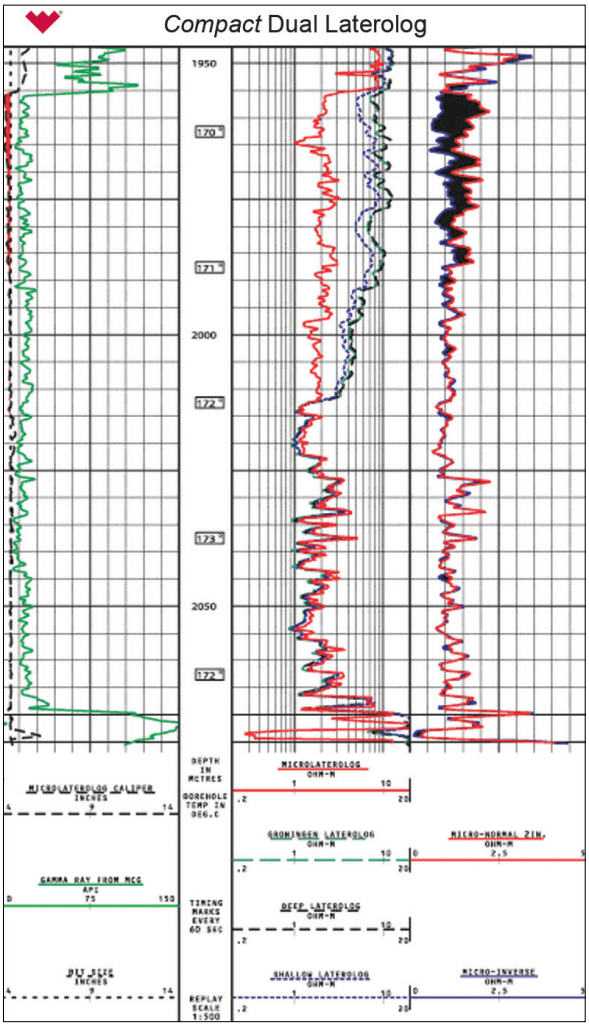
Log Presentation



Specifications

Measurement specifications

Data	Deep and shallow resistivity, Groningen, SP
Logging speed	3,600 ft/hr (1,100 m/hr)
Measurement range	0.1 to 40,000 ohm-m
Vertical resolution	24 in. (0.6 m)
Resolution	1% of measured value
Depth of investigation	Deep: 50.4 in. (1.27 m) Groningen: 50.4 in. (1.27 m) Shallow: 16.2 in. (0.41 m)
Borehole fluids	WBM Salt

Mechanical specifications

Maximum outer diameter	2.25 in. (57 mm)
Length	29.31 ft (8.93 m)
Total weight (in air)	109 lb (49 kg)
Maximum temperature	300°F (150°C)
Maximum pressure	15.0 kpsi (108 MPa)
Maximum borehole diameter	15.7 in. (400 mm)
Minimum borehole diameter	2.8 in. (70 mm)

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