

Formation Evaluation

FEATURES

- Asymmetric design with single transmitter and six receivers (6–80 in. spacing)
- Three-frequency Skin Effect Correction using in-phase signal components
- Proprietary thermal compensation based on individual tool characterization
- Real-time borehole corrections with or without caliper input
- Integrated mud cell for continuous R_m measurement
- 2D software focusing with five radial curves and matched vertical resolution
- Real-time inversion for R_t , R_{x0} , and diameter of invasion (step and linear profiles)
- Invasion mapping and real-time speed correction

BENEFITS

- Delivers accurate resistivity measurements in extreme conditions
- Maintains stability in low-resistivity formations
- Eliminates reliance on correction charts and manual adjustments
- Enhances sensitivity to shallow and mid-range invasion depths
- Provides excellent deep formation response
- Supports advanced formation evaluation and reservoir characterization

Hostile array compensated resistivity tool (H-ACRt™)

Fast, accurate, state-of-the-art array induction for hostile environments

Overview

The Halliburton Hostile array compensated resistivity tool (H-ACRt™) features an asymmetric design with a single transmitter operating at three frequencies and six receiver antennas spaced from 6 to 80 inches. Its robust Skin Effect Correction (SEC) method uses only the in-phase component of received signals at all three frequencies. This ensures stable and precise SEC, even in very low-resistivity formations.

Each tool undergoes individual thermal drift characterization during manufacturing. Combined with sonde-mounted temperature sensors, this enables a proprietary and highly accurate temperature compensation method.

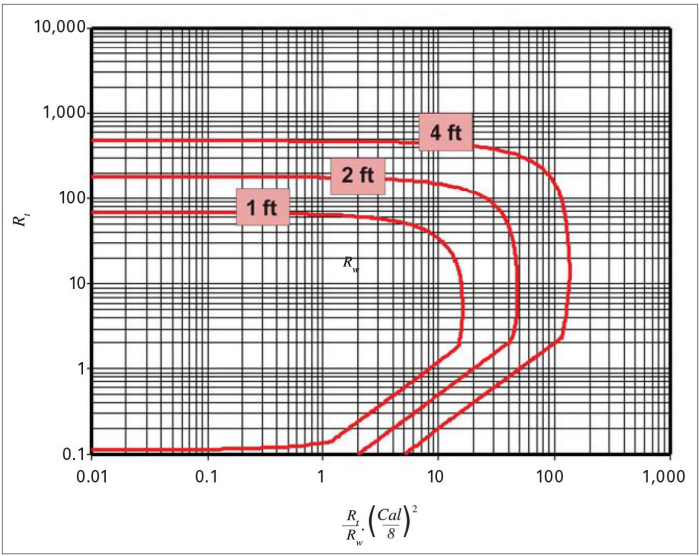
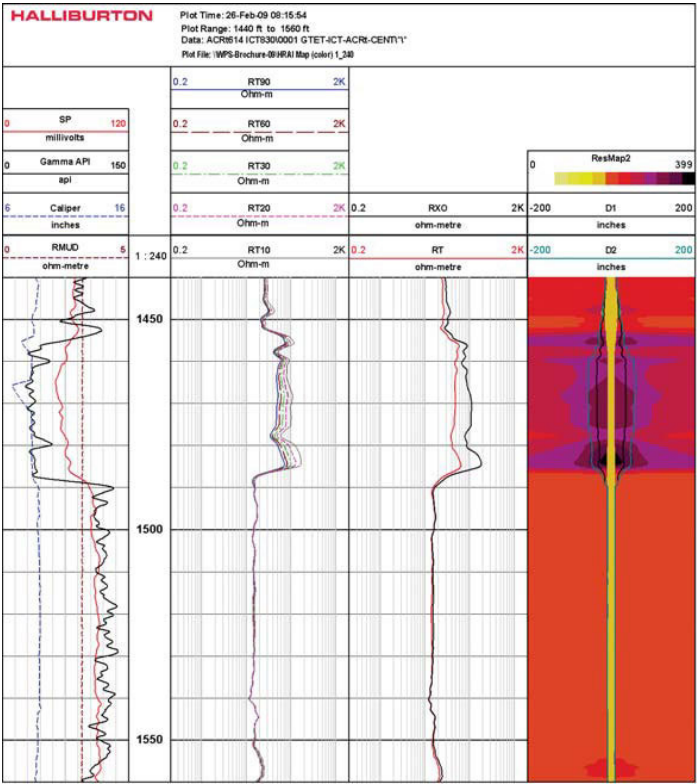
Real-time borehole corrections rely on continuous mud resistivity (R_m) readings from the integrated mud cell and an external caliper. When the caliper is unavailable (e.g., during downlogging), the system derives corrections from short-spaced receiver data alone, which eliminates the need for borehole correction charts.

2D software focusing filters generate five radial curves with matched vertical resolutions of 1, 2, or 4 feet and radial focal depths of 10, 20, 30, 60, and 90 inches. The H-ACRt tool is fully combinable with all other hostile-environment tools.

Applications

- Accurate measures of formation resistivity at varying depths of investigation for enhanced estimates of R_t , R_{x0} , and Diameter of Invasion, either assuming a step (D1) or linear (D1, D2) invasion profile
- Quantitative assessment of S_w , S_{x0} , and moveable water volumes
- Qualitative assessment of permeability and rock quality
- Array induction measurements are available in formations with resistivities from 0.12 to 2000 ohm-m and in water, air, or oil-filled boreholes
- Analysis of finely bedded formations

DATA SHEET



H-ACRt™ preferred extended operating range: 350 to 500°F

Track 1: SP from an external sub, gamma ray, and caliper,
Track 2: depth,Track 3: Radial resistivity curves with DOI of 10, 20,
30, 40, 60, 90 in. Good sensitivity to invasion is in evidence from
1490 to 1450 ft. Track 4 displays the real-time inverted curves Rt
and Rxo, and Track 5 shows the two DOI for a linear invasion profile
model and a 2D image of the invasion map.

Hostile array compensated resistivity tool (H-ACRt™) specifications

LENGTH	MIN BOREHOLE	MAX BOREHOLE	OPERATING PRESSURE	OPERATING TEMPERATURE	WEIGHT	MAX LOGGING SPEED
FT (M)	IN. (MM)		PSI (MPA)	°F (°C)	LB (KG)	FT/HR (M/HR)
29.3 (8.9)	4.25 (10.8)	See chart above	30,000 (207)	500 (260)	464 (210.47)	6,000 (1,830)

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