

Formation Density Probe

The Formation Density probe provides a calibrated, borehole-compensated density measurement using a detachable ^{137}Cs gamma source and dual shielded detectors.

The far spaced detector (LSD) is calibrated, giving the best estimate of formation density as borehole wall effects are minimised. A shorter spaced detector (HRD) is also calibrated which provides improved vertical resolution. An optional shorter spaced third detector (BRD) provides a qualitative log with excellent vertical resolution for bed boundary delineation.

Principle of Measurement:

The source and detectors are held in contact with the borehole wall by a spring-loaded caliper arm measuring diameter for borehole compensation. Gamma radiation from the source is back-scattered (Compton effect) in the formation, reaching the detectors where the relative counts are measured using sodium iodide scintillation detectors. Calibration constants are determined using a water tank and an aluminium block which has previously undergone a primary calibration. The calibration constants are combined with the gamma counts and diameter readings in the supplied software to give a calibrated density in g/cc.

SPECIFICATION:

Features

- Compensated density output in engineering units (g/cc)
- Short-spacing detector for high vertical resolution
- Tungsten shielding reduces borehole effects
- Standard calibration blocks for field or base use

Measurements

- Bulk density
- Dual-calibrated density channels (LSD & HRD)
- Natural gamma
- Caliper
- Options:** Bed-resolution density (BRD) and Temperature

Applications

Minerals:

- Density and porosity
- Lithology
- Bed thickness and boundary location
- Coal ash and moisture content

Engineering:

- Rock strength and elasticity parameters (with sonic log)
- Detection of weathered or fractured zones

Water:

- Location of aquifer and aquitard
- Detection of cavities and missing cement

Operating Conditions

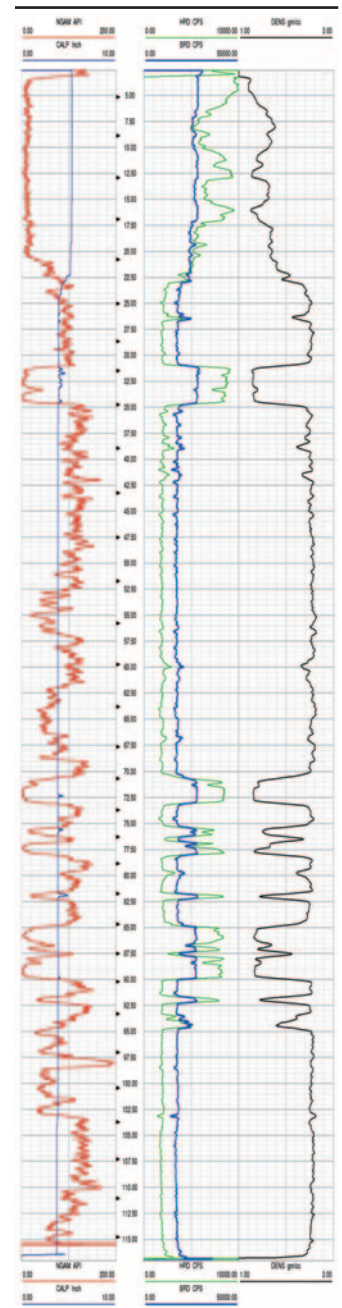
- Borehole type: All, including air filled (qualitative measurement only)
- Recommended Logging Speed: 3m/min

Specifications

- Diameter: 51mm
- Length: 3.02m
- Weight: 24kg
- Temperature: 125°C
- Max. pressure: 20MPa
- Density range: 1.1 to 2.95g/cc
- Caliper range: 51mm to 300mm

Part Numbers

- 1014701 Formation Density probe
– includes BRD and temperature



Example of logging data

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