

Compensated Neutron (GCN)



Compensated Neutron Module

The Compensated Neutron module provides an environmentally compensated porosity log in mud-filled open holes.

An alternative epithermal detector configuration is available for air/gas filled holes. The tool design has been optimised to provide good performance at acceptable logging speeds while still using a relatively small 92GBq 241Am-Be source. It is combinable with the Litho-Density and Dual Induction log in a single run.

Principle of Measurement:

The Compensated Neutron measurement uses two ³He proportional detectors and a side-door entry sealed neutron source. Fast neutrons emitted by the source are scattered and slowed down by light elements (principally hydrogen) in the formation. The ratio of the neutron flux reaching the detectors depends on the formation hydrogen index/formation porosity.

Neutron porosity measurements are affected by the borehole environment. These effects are compensated in software by algorithms calculated by Monte Carlo modelling and benchmarked to standards at the Callisto facility in Leicestershire, UK.

SPECIFICATION:

Features

- Well characterised tool response based on computer calculations for limestone, sandstone and dolomite
- Fully digital telemetry combines with density, induction and other logging probes
- Low-activity source requirements for safe handling and cost reduction
- High-resolution measurement
- Maximum data sampling rate is 1cm (0.4")

Measurements

- Porosity ϕ
- Ratio long/short and raw counts

Applications

- Porosity
- Lithology (in conjunction with other logs)
- Gas/light hydrocarbon detection
- Correlation between wells

Operating Conditions

- Borehole type: fluid filled \varnothing :102mm (4") to 305mm (12")

Specifications

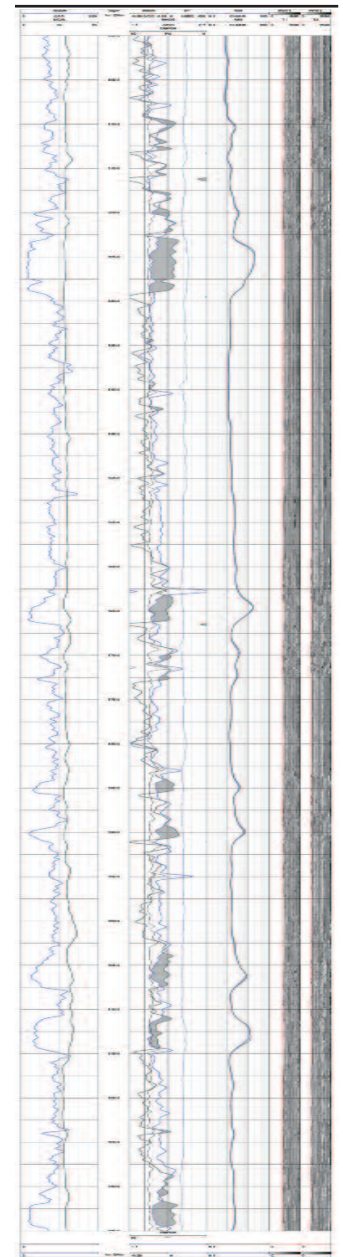
- Diameter: 63mm (2.5")
- Length: 2.27m (89.4")
- Weight: 28kg (62lb)
- Max. temperature: 125°C
- Max. pressure: 86MPa (12,500psi)
- ³He detectors offsets: 203 mm (8") and 406 mm (16")
- Porosity Range: -15% to 60% (limestone scale)
- Resolution: 0.6 PU in 152 mm (6") borehole at 15% porosity
- Radius of investigation: 152 mm (6") - 406 mm (16")

Part Numbers

- 1003942 Compensated Neutron module

Accessories:

- 1013962 92 GBq 241Am-Be source
- 1004124 Source holder
- 1004122 Source transport pig
- 1004123 Source handling tool set
- 1004137 Field check jig
- 1017411 Dual-band eccentriciser for neutron/telemetry



Example of logging data