semm Logging
WELL LOGGING SERVICES

TECHNICAL SHEET

OIL FIELD	COMPENSATED NEUTRON MODULE	SLIM-2.5”

Generality and principle of measurement

The compensated neutron probe 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.

The compensated neutron measurement uses two ^{3}He 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.

Measurements and applications

Porosity ϕ	Porosity
Ratio long/short and raw counts	Lithology (in conjunction with other logs)
	Gas/light hydrocarbon detection
	Correlation between wells

Technical specifications

Length	2.07 m (81”)
Diameter	63 mm (2.5”)
Weight	27 kg (59lb)
Max. Operating Temperature	125°C
Max. Operating Pressure	86 MPa
Operating conditions	Fluid filled Borehole Ø:102mm (4") to 305mm (12")

Sensor Array

^{3}He 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”)