
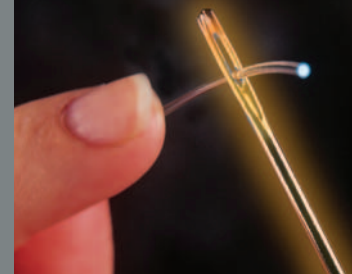




Schlumberger

SlimXtreme



The slim logging
solution for hostile
environments

Applications

- Triple-combo formation evaluation in any combination of
 - slim or standard boreholes
 - deep, high-pressure wells
 - high-temperature wells
- Drillpipe-conveyed logging in highly deviated and short-radius wells
- Remedial applications in wells experiencing lost circulation

Benefits

- Latest formation evaluation technology in small-diameter, high-pressure, high-temperature (HPHT) wellbores
- Tool design enables logging of highly deviated wells on wireline
- Reduces operational costs through improved tool reliability, combinability and fast rig-up/rig-down

Features

- Extends operating times at high temperatures
- Provides data quality identical to that from standard tools
- Accommodates a wide range of borehole sizes
- Provides real-time speed-corrected data
- 3-in. maximum outside tool diameter
- Sensors that measure acceleration, mud temperature, tension and compression
- Built-in standoff in AIT* Array Induction Imager Tool
- Full combinability with SlimAccess* wireline logging platform for slim and complex geometry boreholes and Xtreme* HPHT well logging platform
- Design combination of Dewar flask and pressure housing
- Robust tool and sensor design

The SlimXtreme* slimhole HPHT well logging platform from Schlumberger provides reliable formation evaluation data in hostile drilling environments. By combining durable sensors rated to high pressures and temperatures, slimhole design, and a full range of accessories, the SlimXtreme platform gives you real-time wellsite answers with high-quality data that are comparable to that of standard logging tools.

The SlimXtreme platform is a technological breakthrough for logging in hostile environments. Its rugged and reliable sensors are rated to 500°F and 30,000 psi, and are integrated onto one wireline string that can log ultradeep wells with borehole diameters as small as 3 $\frac{7}{8}$ in. These sensors, combined with integrated tool accessories and measurements, help obtain the formation evaluation data you need in unfriendly logging environments.



The ready-for-rig-up SlimXtreme tool is easy to handle in a field operation.

SlimXtreme technology

Advanced engineering combines the AIT resistivity, formation photoelectric absorption cross section, bulk density, thermal neutron porosity and gamma ray measurements. All the tools use advanced wireline digital telemetry rated to the same pressure and temperature as the complete platform, and are capable of transmitting data through wireline cables as long as 36,000 ft.

The full combinability of the SlimXtreme tool with the Xtreme and SlimAccess platforms enables Schlumberger to provide accurate and high-quality wireline logging solutions in the most challenging environments.

SlimXtreme array induction tool

The five depths of investigation and the three vertical-resolution measurements have the same high quality as those recorded with the conventional AIT tool family. Tool output is fully corrected for borehole and environmental effects, and computations of water resistivity and saturation, invasion profile, and true resistivity, and invaded-zone resistivity provide a better understanding of reservoir characteristics. The tool output is enhanced by the real-time mud resistivity measurement, which permits computation of tool standoff and environmental corrections.

Designed with a built-in standoff, the tool has a nominal diameter of 3 in.; hence, hostile wellbores as small as 3 $\frac{7}{8}$ in. can be logged.

SlimXtreme Litho-Density photoelectric density tool

SlimXtreme Litho-Density* photoelectric density tool, a three-detector mandrel tool, can be combined with a powered caliper, or for temperatures and pressures above 400°F and 20,000 psi, with a passive caliper employing a bowspring. The tool measures formation density and photoelectric effect using full spectral data from the three-detector array. The formation bulk density is measured using an extended three-detector spine-and-rib algorithm. Its depth of investigation and vertical resolution are the same as in traditional pad tools.

The tool is rated to 30,000-psi pressure and to 500°F for 5 hr continuous logging. The tool diameter is 3 in., and the minimum hole size that can be logged with this tool is 3 $\frac{7}{8}$ in.

SlimXtreme compensated neutron porosity tool

The SlimXtreme compensated thermal neutron porosity tool delivers the same high-quality, environmentally corrected porosity data that are available from the traditional CNL* Compensated Neutron Log. The tool diameter is 3 in. The tool is rated to 500°F and 30,000 psi for up to 8 hr continuous logging. The minimum hole size it can log is 3 7/8 in.

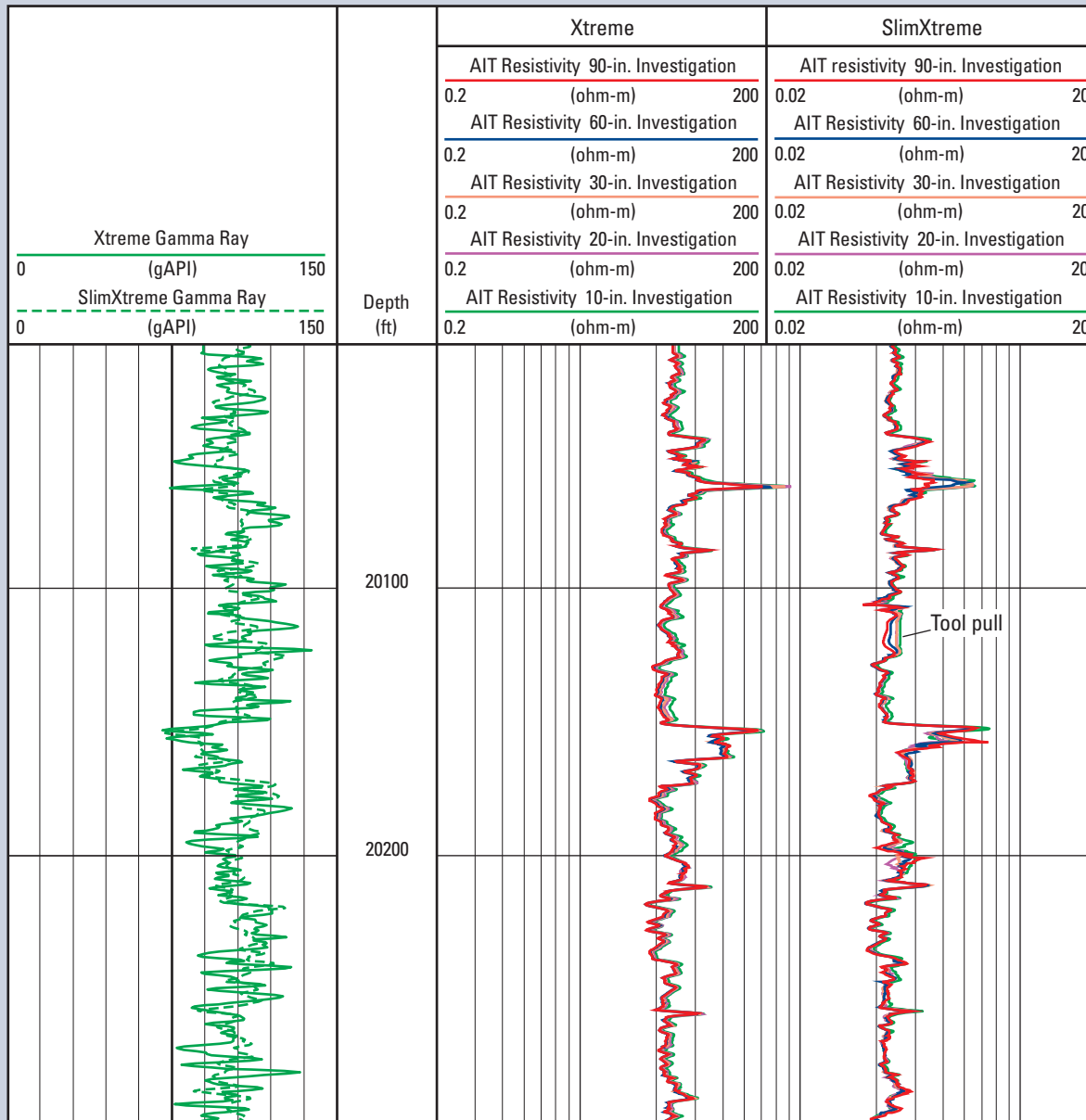
SlimXtreme telemetry and gamma ray cartridge

The integrated telemetry, gamma ray and accelerometer cartridge provides real-time speed corrections for all SlimXtreme measurements. The tool is rated to 500°F for 8 hr continuous logging. The minimum hole size is 3 7/8 in.

SlimXtreme logging head

A special wireline logging head measures real-time downhole cable tension and mud temperature. An integral electrical cable release capability allows the cable to be freed from the tool string in a controlled manner by application of electrical current if the tool string becomes stuck.

In this South Texas well, with temperatures exceeding 478°F [247°C], the SlimXtreme platform acquired triple-combo high-resolution data with the tool string exposed to maximum temperature for more than 1 hr. The log example compares the measurement of the SlimXtreme array induction tool with that of the 3 7/8-in. Xtreme array induction tool recorded 1 week after the SlimXtreme run. The second run recorded a temperature of 489°F [254°C]. The superior resolution and precision of the SlimXtreme measurement show uncompromised data quality at extreme well conditions. The SlimXtreme gamma ray tool was used in both runs.



Accessories

HPHT logging accessories are designed specifically to complement the SlimXtreme platform. These include flexible joints for logging highly deviated wells, swivel adapter heads, tool tension and compression devices, extra-strong logging cable, and the TLC* Tough Logging Conditions system for drillpipe conveyance. A double-drum capstan system is also available to reduce cable surface tension when logging deep wells.

SlimXtreme Tool Specifications

Tool	Telemetry and Gamma Ray	Compensated Neutron	Litho-Density	AIT
Temperature (°F)	500	500	500	500
Pressure (psi)	30,000	30,000	30,000	30,000
Makeup length (in.)	128	143	176	370
Weight (lbm)	182	191	267	499
Max OD (in.)	3	3	3	3
Max logging speed (ft/hr)	3600 [†]	1800	1800	3600 [†]
Min hole (in.)	3 $\frac{3}{8}$	3 $\frac{3}{8}$	3 $\frac{3}{8}$	3 $\frac{3}{8}$
Max hole (in.)	20	10	9	20
Holding time at 500°F (hr) [‡]	8	8	5	8

[†] High-speed mode (1800 ft/hr standard mode)

[‡] In logging conditions with tool powered

The log example shows a comparison between two offset wells. The superior resolution of the SlimXtreme neutron porosity–Litho-Density log data depicts layered formations in Well No. 1, while the standard neutron-density log in Well No. 2 detects the main features only.

