

VIVID®

Acoustic Listening Platform

If it's there, we'll detect it**Full bandwidth - full information**

With its industry leading sensitivity and unparalleled frequency bandwidth, **VIVID®** brings clarity to downhole fluid movement evaluation.

Combining innovative sensor technology with interactive processing, Archer's next generation acoustic listening platform expands the envelope to encompass a frequency range all the way from audible up to high frequency ultrasound, creating the first truly broadband listening platform.

Expanding the acoustic envelope

Turbulent fluid movement in the downhole environment, both wanted and unwanted, generates sound energy across a broad frequency spectrum. Conventional tools are only sensitive to a limited range, traditionally either low or high frequency, with the remainder of the spectrum overlooked.

VIVID® is equipped with dual sensors, each optimised for different frequency ranges, to optimise response over the entire measurement range.

An innovative pressure balanced mounting design allows the acoustic window of each sensor to be directly coupled to well fluid, eliminating the need for oil-filled pressure compensation chambers, leading to minimum transmission loss, maximum sensitivity and rugged reliability.

Fully combinable with additional sensors for complete evaluation of integrity dynamics.

Key Benefits

- Diagnose tubing, casing and zonal isolation failures without pulling the completion
- Precise identification of fluid movement depths
- Spectrum analysis allows characterisation of leak behaviour
- Real-time display allows rapid on-site evaluation
- Industry leading sensitivity reveals previously indiscernible leaks

Applications

- Barrier leak detection in tubing, casing and completion components
- Detection of fluid flows behind pipe
- Evaluation of cross-flows
- Appraisal of sealing performance of cement barriers

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Sensitivity and precision

Utilising the full acoustic frequency spectrum allows detection of small signals behind multiple casing strings, while the known properties of ultrasound allow very precise depth information.

High sensitivity allows detection of very small fluid flows, even in cement where conventional bond tools indicate zonal isolation.

Broadband understanding

Fully broadband data sampled at high resolution allows characterisation of the type of leak as well as the fluids involved.

Interactive analysis software allows the full spectrum of data to be viewed in a variety of formats to enable full understanding.

In this example, gas entry into liquid filled tubing through a leaking unloading valve is clearly seen on the spectrum view. Applying simple bandwidth equalisation shows both the entry point of the gas and also the characteristic signature of gas bubbling through a liquid column. Traditional noise level curves are generated over specific frequency ranges and precisely locate the depth of the gas entry. Auxiliary measurements run in combination with VIVID® complete the picture for a full understanding of the downhole environment.

Specifications

Sensors

Type	Passive acoustic
Number	2
Frequency range	<1 kHz - 656 kHz

Operational

Dynamic logging	Yes
Stationary logging	Yes
Typical logging speed	30 ft/min [9.1 m/min]
Typical stationary time	15 sec per station
Logging mode	Real-time and memory

Physical

Outer diameter	1-11/16" [43 mm]
Length	29.3' [745 mm]
Weight	10.8 lb [4.9 kg]

Environmental

Maximum temperature	350°F [177°C]
Maximum pressure	15,000 psi [1 034 bar]

