

CBL - VDL



Cement Bond Log – Variable Density Log

OPERATING PRINCIPLE:

The Cement Bond Log instrument acquires an omnidirectional, high-resolution full-wave acoustic data in cased and open holes. It accurately infers directly the cement quality from the degree of acoustic coupling of the cement to the casing and to the formation.

One ceramic monopole transmitter and two ceramic receivers are used to produce and analyse the waves.

It operates on the principle that acoustic amplitude (in millivolts) is rapidly attenuated in good cement bond but not in partial bond or free pipe.

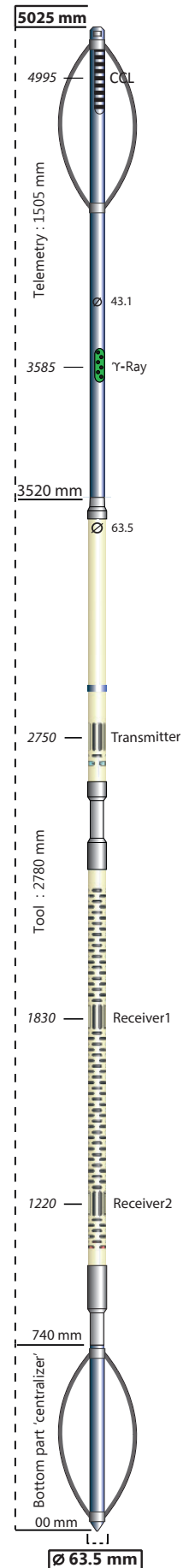
Reduction of the amplitude or increase of the decibel attenuation is an indication of better quality bonding of the cement behind the casing to the casing wall.

On the recorded **cased hole** data, it is possible to identify the Cement Bond and define a Bond Index.

Cement bonding is affected by:

- Cement job design and execution as well as effective mud removal
- Cement in place and its mechanical properties (compressive strength)
- Temperature and pressure changes applied to the casing after cementing
- Cement additives or epoxy resin applied to the outer wall of the casing

On the recorded **open hole** data, it is possible to obtain information on formation's interval transit time.

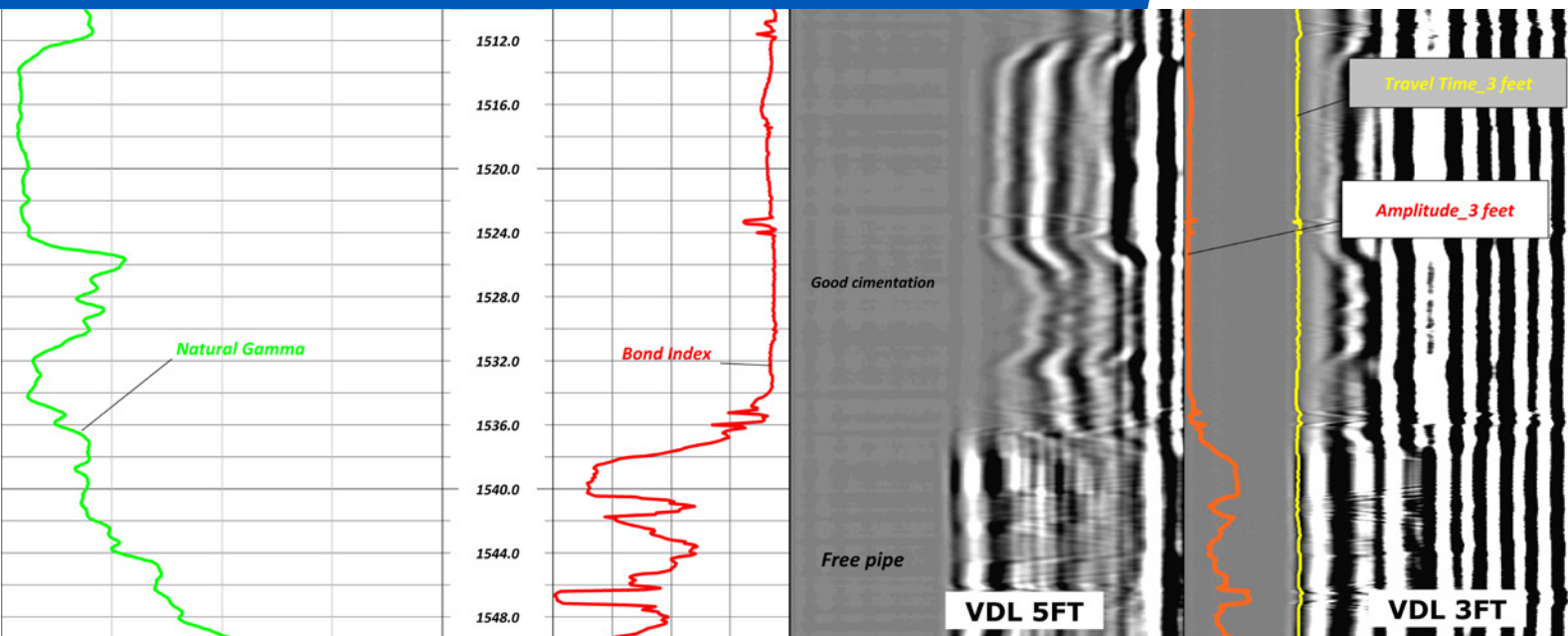


APPLICATIONS

- / Evaluation of cement quality
- / Determination of zone isolation
- / Location of cement top
- / Leakage source detection
- / Well integrity

BENEFITS

- / Surface leakage prevention
- / Hydraulic Bond
- / Zone isolation



SPECIFICATIONS:

	imperial	metric
Max. OD	2.5"	63.5 mm
Length	16.4'	5.03 m
Weight	72.3 lb (90.4 lb with Telemetry)	33 kg (41 kg with Telemetry)
Max. Temperature	257/350 °F	125/175 °C
Max. Pressure	12 kpsi	850 bar

Transmitter type Ceramic, monopole

Spacing

T1-R1	3 ft 915 mm
T1-R2	5 ft 1515 mm
Verification	Casing slowness check 187µs/m (57µs/m)

Logging Parameters

Casing OD Range	4" - 16" 100 - 400 mm
Logging Speed	1800 - 3000 ft/h 9-15 m/min
Sample rate	Selectable
Centering	Required
Cable compatibility	Mono or multi conductor
Top Connector	GO1

Output

Depth Correlation (Gamma Ray, CCL)
Run-time
Single receiver transit time (T1-R1, T1-R2) [µsec]
Full Waveform [µsec]
Amplitude Near, Amplitude Far (mV)
BI - Bond Index

Measuring Parameters

Full-wave sonic	
Vertical Resolution	2' 610 mm
Measuring Range	15-250 µsec/ft 50-800 µsec/m
Accuracy of DT ¹	1 µsec/ft +/- 3µsec/m
Repeatability of DT ¹	1 µsec/ft +/- 3µsec/m

¹ centralized tool in a 200mm OD casing

Verification	Casing slowness check 187µs/m (57µs/m)
--------------	---

Gamma Ray

Sensor type	NaI scintillation crystal
Range	0 - 3000 GAPI
Accuracy	+/- 5% of measured values ²

² Gamma Ray measurements are radioactive measurements and hence subject to statistical variations. These variations depend inter alia on logging speed and filter strength.