

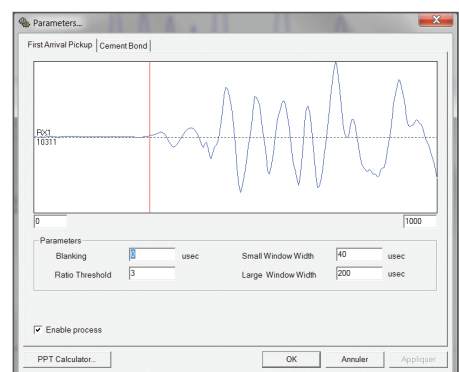
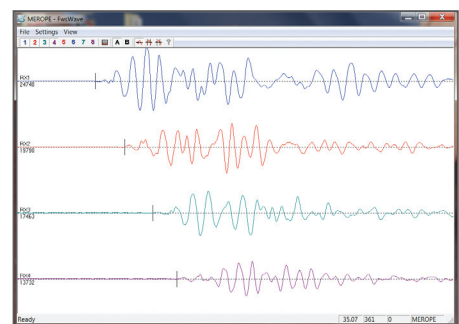
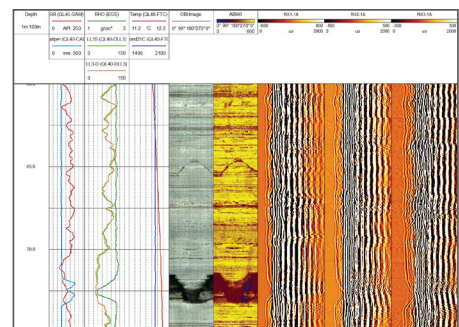
# QL40.FWSS Full Wave Form Sonic

The ALT QL40 full waveform sonic tool - QL40 FWSS - is mainly dedicated for the water, mining and geo-technical industries. Its specification makes it ideal for cased-hole, open-hole applications and also to carry out fractures identification.

Sonic logs are widely used, often in combination with other logs, to provide porosity, permeability and geo-mechanical properties of the rocks. Under suitable borehole conditions and formations, compressional (P), shear (S), stoneley and tube wave arrivals can be detected.

The QL40 FWSS tool is optimized for such purpose. It implements a high energy source generated by a ceramic-piezoelectric transducer which excites the formations. Real time display and analysis of the recorded full wave forms are performed by the tool. The QL40 FWSS is supplied as a **bottom sub** of the Quick link (QL) product line and can be combined with other QL40 tools to form a tool string or it can be run as a standalone tool.

The tool can only be operated in a fluid-filled hole. Logging speed depends on tool configuration and acquisition parameters.



## Application

- Cased-hole :
  - Cement bond logging (CBL)
- Open-hole :
  - Porosity evaluation
  - Permeability
  - Lithology identification
  - Variation of rock strength
  - Calculation of rock mechanical properties (elastic moduli, poisson's ratio, shear modulus, young modulus, bulk modulus and compressibility)
  - Identification and hydraulic characterization of fractures

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## Principle of measurement

During logging, a series of high frequency sonic impulses are emitted by the tool. Following their passage through the borehole fluid and formations, they are detected by receivers at various distances from the transmitter. At each receiver the arriving waveform is digitally sampled according to a set of predefined tool configuration parameters (sample rate, sampling period).

The digitized waveforms are subsequently transmitted to the surface acquisition and recording system.

## Measurements/derived parameters

- Full waveform per receiver
- Real time p-wave velocity or slowness
- Real time CBL processing
- Additional post processing module available in WellCAD

## Operating Conditions

- Fluid filled borehole
- Minimum borehole diameter 60mm
- Centralizers recommended for CBL application

## Technical Specifications

### Tool

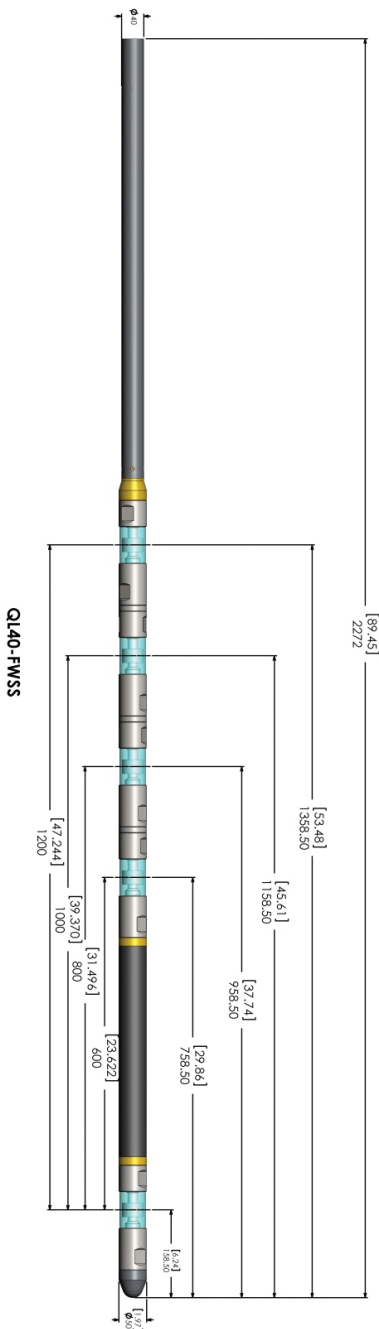
- Diameter: max 50mm
- Length: standard configuration: 2.27m (89.45")  
1TX – 4RX with 0.2m (7.87") RX separation
- Measurement point: transmitter location
- Max Temp.: 70°C (158°F)
- Max. Pressure: 200bar (2900psi)

### Cable

- Cable type: mono, coaxial, 4 or 7 conductor
- Digital data transmission: up to 500 Kbits per second depending on wireline
- Compatibility: ALTLogger – BBOX – Matrix

### Sensors

- Transducers: ceramic piezoelectric with 15 KHz resonant frequency
- Sonic Wave Sampling Rate:  
Normal Mode: 4 µs  
Extended Mode: 20 µs
- Sonic Wave Dynamic Range: 16 bits
- Sonic Wave Sample Length:  
Normal Mode: up to 4 ms  
Extended Mode: up to 16 ms



The specifications are not contractual and are subject to modification without notice.



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