

DIMENSIONAL ACOUSTIC LOGGING TOOL

The Dimensional Acoustic Logging Tool (DALT) allows the analysis of the fluid flow in vertical, deviated, and horizontal wells. The key feature of the tool is its ability to differentiate between vertical and horizontal flow using its three dimensional acoustic sensors, which is critical for identifying flow intervals and diagnosing well integrity issues.

Three directional acoustic sensors, with their high precision ($\leq 5\%$ transverse conversion coefficients), allow the tool to accurately detect and separate acoustic signals from different directions. It enables the tool to distinguish between vertical flow (within the wellbore) and horizontal flow (behind the casing or in the formation) as well as reconstruct the flow vector (direction and magnitude), which is particularly useful in deviated or horizontal wells, where flow dynamics are complex and multidirectional.

The orthogonal arrangement of three dimensional acoustic sensors help to isolate and filter out noise or interference. Such an approach improves the signal-to-noise ratio and ensures more accurate logging.

Applications:

- Well integrity evaluation (tubing/casing leaks, completion elements leaks, etc.)
- Behind-the-casing flow detection
- Perforations/SSD/ICD/frac-ports performance evaluation
- Fractures and reservoir flow intervals localization
- Detection of complex flow patterns in horizontal wells

Advantages:

- Vertical vs horizontal flow differentiation
- Enhanced noise differentiation
- Flow vector reconstruction
- Built-in XYZ accelerometer and CCL



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Tool Specifications	
Number of dimensional sensors	3
Number of spectral channels	4
Frequency range	0.0-8.0 kHz
Built-in XYZ accelerometer	Yes
Built-in CCL	Yes
Maximum operating pressure	11,603 PSI (80 MPa)
Maximum operating temperature	150°C (302°F)
Tool OD	1.65 in (42.0 mm)
Tool length	5.0 ft (1.5 m)
Tool weight	20.0 lbs (9.1 kg)
Connections	15/16 SR
Operational time	Over 100 hrs
H ₂ S resistance	6% standard (28% optional)
CO ₂ resistance	12%
Surface read-out / Memory	Memory

