

# ACOUSTIC BOREHOLE IMAGER ABI-43

Slimhole, High Temperature Acoustic Borehole Imager

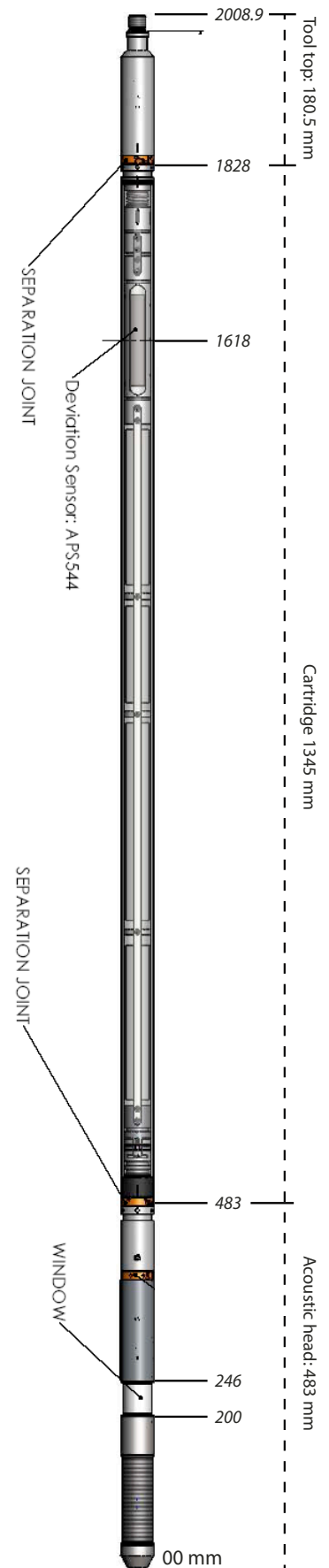
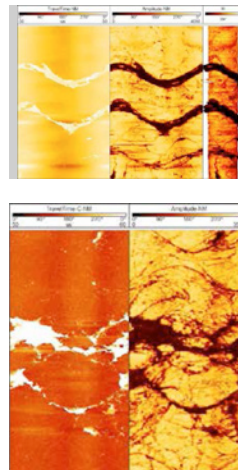
## OPERATING PRINCIPLE:

The Acoustic borehole Imager records a 360° unwrapped 3D image of the borehole wall by transmitting ultrasound pulses from a rotating sensor and recording the amplitude and travel time of the signals reflected at the interface between mud and formation (borehole wall). The tool can work both in open and cased holes, giving crucial information in both cases.

In open hole, the purpose of the acoustic borehole imaging tool is to provide detailed, oriented caliper and structural information on the basis of high resolution, ultrasonic travel time and amplitude images. The tool emits an ultrasonic beam towards the formation and records the amplitude and the travel time of the reflected signal. The amplitude record is representative of the impedance contrast between the rocks and the fluid, hence giving information about acoustic (elastic) properties of the surrounding rock. Therefore, the tool is ideal for fracture detection and geotechnical rock classification. The travel time is used to determine exceptionally accurate borehole diameter data, which makes the tool ideal for borehole deformation description, stress field analysis and casing inspection (see cased hole applications). (stress field analysis). Travel time is also used for quality control of the amplitude measurement.

This fully digital tool uses a high precision orientation package incorporating a 3-axis fluxgate magnetometer and 3 accelerometers for the orientation of the images to a global reference and determination of the borehole's azimuth and inclination.

In cased hole, the tool along with sophisticated algorithms and real time processes are also implemented to extend the possible tool applications to casing thickness measurement, corrosion evaluation and measurement behind a PVC casing.



## APPL ICAT IONS

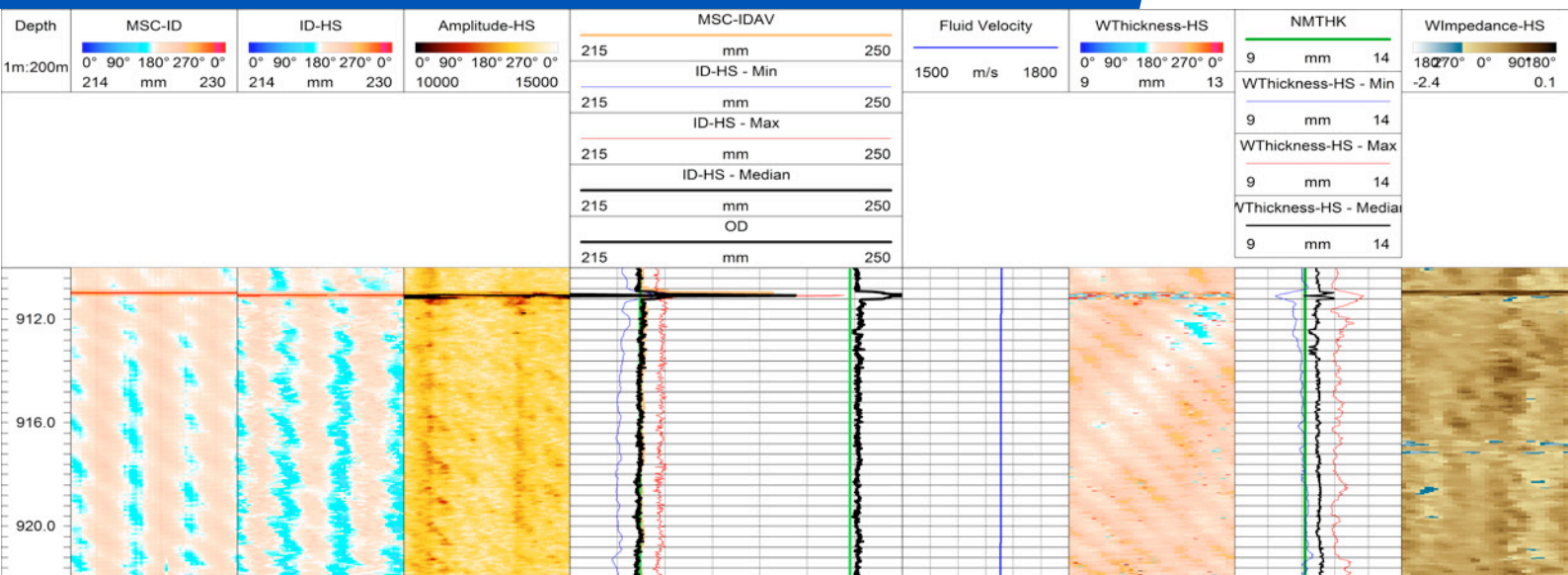
Open hole

- // Fracture detection and evaluation
- // Detection of thin beds
- // Determination of bedding dip
- // Lithological characterization
- // Breakout analysis
- // Monitoring of earth stress field
- // High resolution caliper measurements

## APPL ICAT IONS

Cased hole

- // Inside & outside diameter
- // Detection of internal damage or deformation
- // Casing thickness
- // Metal loss indicators
- // Corrosion detection
- // Casing inspection
- // Perforation position & aperture



## SPECIFICATIONS:

	imperial	metric
Max OD	1" 11/16	43 mm
Length	79"	2.0 m
Measurement point	70" from probe top	1.77 m
Weight, kg [lbs]	22 lb	10 kg
Max Temp, °C [°F]	257°F	125°C
Max Press, bar [kpsi]	700 bar, 10 kpsi	700 bar

### Logging Parameters

Open hole: Borehole diameter	3" x 21" <sup>1</sup>	76 x 533 mm <sup>1</sup>
<b>Cased Hole</b>		
Casing diameter	5 1/2" x 15" <sup>2</sup>	147 x 381 mm <sup>2</sup>
Min thickness	0,2"	5 mm
Tool zero	Acoustic head (0.22m from tool bottom)	
Cable Compatibility	mono, multi-conductor, coax	
Data transmission	Up to 500kbps depending on wireline	
Logging Speed	5m/min (OH mode, 175kbps, AzRes = 144, VRes: 4mm) 8m/min (CH mode, 175kbps, AzRes = 72, VRes: 1cm, Casing 7")	
Centralizers	slip-over & in-line	

<sup>1</sup> Focus Optimized for 8" 1/2 borehole depending on borehole conditions

<sup>2</sup> Focus Optimized for 8" 1/2 Casing

### Measuring Parameters

Acoustic Head	Open Hole & Corrosion (OHCO-L)
Acoustic Sensor	Fixed transducer and rotating focusing mirror
Focusing	Collimated acoustic beam
Frequency	0.5 MHz - 1.2 MHz
Rotation Speed	up to 200 revolutions per second
Azimuth Accuracy	+/- 1.2°
Azimuthal resolution (samples per revolution)	72, 144, 288 user selected
Caliper resolution	0.08 mm (0.003")
Natural Gamma Ray	1" x 4" NaI (Ti) scintillation crystal
Deviation	APS 544 - 3 axis magnetometer, 3 accelerometers.
Inclination Accuracy	+/- 0.5°