

RADii[®] Cement-Bond Tool – Large Diameter

Identifies cement channeling as well as generates the traditional cement bond log and a variable-density log

Applications

- Cement-bond quality
- Formation isolation
- Cement channeling

Features and Benefits

- Fully Probe[®] high-speed digital (HD) platform compatible
- Full SRO and memory capability
- Master calibration storage in tool memory retrievable when no free pipe is encountered in the well
- High temperature (HT) version for hostile environments

Tool Description

The Weatherford large diameter RADii segmented cement-bond tool uses a single ceramic transmitter, a sixteen-segment receiver at 3 ft, and a single receiver at 5-ft spacing. The segmented receiver generates a cement map enabling identification of cement channeling while the single receiver generates the traditional cement-bond log (CBL) and a variable-density log (VDL).

The large diameter RADii segmented cement bond tool comes in two configurations: Probe telemetry (PTX) and HD.



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Specifications

Ratings and Dimensions

	PTX	HD
Maximum temperature	350°F (177°C)	
Maximum pressure	20,000 psi (138 MPa)	15,000 psi (103.4 MPa)
Outside diameter	3.5 in. (88.9 mm)	
Length	9.35 ft (2.82 m)	
Weight	175.7 lb (9.40 kg)	
Tensile strength	Tension: 40,000 lb Compression: 40,000 lb	
Casing/tubing OD (in./mm)	Min: 4.5 in. (115 mm) Max: 20 in. (508 mm)	
Measure points (ft/m)	Amplitude, TT: 4.3 ft (1.3 m) VDL, signature: 3.3 ft (1.0 m)	
Materials	Corrosion resistant materials used throughout	N/A

Borehole Conditions

	PTX	HD/Memory	HT
Borehole fluids	OBM, WBM		
Tool positioning	Centralized with one each centralizer above and below		
Logging speed	Recommended: 60 ft/min (18.2 m/min) Max: 100 ft (30.5 m)/min at 0.08 ft (.02 m) sample rate		

Electrical

	PTX	HD
Current	82 mA at 130 V	90 mA at 50 V (SRO) 90 mA at 19.2 V (memory)

Calibration

	PTX	HD
Primary	9.625 in. (24.4 cm) pressurized calibration tank	
Wellsite	Free pipe, stored calibration tank waveforms on demand	



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Specifications (continued)

Hardware Characteristics

	Standard	HD
Source type:	One piezoelectric crystal fired at 20 kHz, 50 ms intervals	
Sensor type	Omni receiver: One 20-kHz piezoelectric Radial receiver: One 8-segment 20-kHz piezoelectric	
Fire rate	20/sec	
Waveform	Analog: 3 ft (.9 m), 5 ft (1.5 m) Digital: telemetry data	
Record time	1,400 microns for each receiver 500 microns for each sector	
Combinability	GR, CCL, ProMac [™] , iQ [™] , temperature	
Connections	Top: GOI box Bottom: GOI pin	
Acquisition mode	SRO	SRO with TCU Memory with MLT

Measurements (all configurations except where noted)

	E ₁ Peak Amplitude	Sonic Waveform
Principle	Sonic Wavetrain Attenuation	
Range	200 to 1500 μs	
Resolution	3 ft/0.9 m	5 ft/1.5 m
Precision (1 SD)	< 1 mV	N/A
Primary curves	Amplitude: 3 ft (0.9 m) Individual sector amplitudes: (3 ft) (0.9 m) TT: 3 ft (0.9m) VDL 5 ft (1.5 m) Borehole temperature*: 6.48 (1.98 m)	
Secondary curves	PTX and temperature: head voltage, internal temperature HD: head voltage, internal temperature, accelerometer, volume	

*Temperature sub configuration only

